BURMA GAZETTEER

LOWER CHINDWIN DISTRICT

UPPER BURMA

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GLOSSARY.

Chaung, stream.

Chetty, the money-lending caste of Madras.

Myothugyi, vide *ywa-thu-gyi*.

Nat, spirit.

Pèdi, green bean.

Taiksa-ye, syn. myosa-ye.

Tari, toddy, *borassus flabelliformis*.

Thathameda, the household tax.

Thitya, the *shorea obtusa*.

Thugyi, ywa-thu-gyi, headman of a circle of villages.

LOWER CHINDWIN DISTRICT

(UPPER BURMA)

PART A.—THE DISTRICT.

CHAPTER I.—Physical Description.

The Lower Chindwin district lies between north latitudes 21° 48′ and 22° 50′ and east longitudes 94° 16′ and 95° 39′, and falls partly within the Dry and partly within the Northern Wet zones of Burma. The wet-zone portion consists of a fringe of mountainous forest-clad country, extending along the western and northern border. The greater portion of this area has been made into forest reserves, the physical features of which will be found described in Chapter V, but some of the valleys have been excluded. All the rest of the district falls within the dry zone, though there are, as would be expected, increments in the rainfall as the hills are approached.

The district belongs to the Sagaing administrative Division or Commissionership. The adjoining districts are—

On the west, the Pakôkku district;
On the north, the Upper Chindwin and Shwebo districts;
On the east, the Shwebo district;
On the south, the Sagaing and Pakôkku districts.

Boundaries.

The boundaries, which have not been officially notified, for the most part follow natural features. On the west the Pôndaung, a spur of the Chin Hills which culminates in a peak 4,364 feet high, and, for a short distance, the Pônnyadaung, a parallel range on the west, divide the district from Pakôkku. In the north, the boundary with the Upper Chindwin and Shwebo districts traverses main drainage lines. On the north-east the boundary is artificial, but follows the general line of the watershed between the Mu and Chindwin rivers until the Mu, an important tributary of the Irrawaddy, is reached, and becomes the boundary. The

south-eastern boundary with Sagaing is artificial. The south-western boundary is formed for a considerable distance by the South Yama stream, a tributary of the Chindwin; thereafter the boundary runs across drainage lines up to the Pôndaung.

The boundary in the north-east is shown incorrectly in the 1 inch = 4 miles survey map of April 1902 (South-East Frontier).

The culturable portion: west of the Chindwin.

The culturable portion of the district is roughly triangular in shape, the base of the triangle being the southern boundary of the district, and the apex the point at which the Chindwin enters the district from the north. The greatest length of this portion is about 60 and the greatest breadth about 90 miles. Starting from the south-west, the Pôndaung throws off to the Chindwin two important tributaries, the North and South Yama streams. The North Yama contains a little water throughout its length in the hottest months of the year; the South Yama is dry during the hot months, except below its junction with the Taya stream, which is spring-fed and perennial and supplies a trickle of water. The country between the Yamas is divided from north to south by the Pagyi hills on the west and the high ground north and south of Salingyi on the east. West of the Pagyi hills lie the tangled valleys and hills which the people call the Ku-hnit-ywa and Shit-ywa *gyaungs* or glens, the latter lying to the north. East of the Salingyi uplands the country slopes, gradually except in the south, to the Chindwin, and to the north-west the high land rises to Powindaung, a hog-backed hill which forms a conspicuous natural feature. In the north-eastern corner rise several isolated hills of some height, Letpadaung 1,053 feet, opposite Mônywa, being the most prominent. The watershed of the South Yama, except in the east near its mouth, is a hardly noticeable ridge, in few places more than a mile north of the stream, and the North Yama takes all the drainage of the Pagyi slope.

From the north the North Yama receives the drainage of sandy, high-lying, infertile country, but none of the streams flows except after heavy rain. From the north-west comes in the Tinzôn, which drains the southern slopes of the Mahudaung, an outlying spur of the Chin Hills system, east of and parallel to the Pôndaung.

The Salingyi uplands are prolonged across the North Yama, north of which there is no extensive level plain, the highest point being Wazein, 1,177 feet, in the south-east of the Kani township. Above Wazein a volcanic ridge pushes north-east to the Chindwin at Shwezaye, and in this ridge

occur several explosion craters, the best known being at Twin village. The ridge continues east of the Chindwin, and on that side are two similar craters. Where the Chindwin has forced a way through this ridge, its waters are confined within forbidding cliffs at the Shwezaye defile. Fifteen miles above the defile the Chindwin, at Kani, receives from the west the Yewa, a non-perennial stream which drains the middle slopes of the Mahudaung. North of Kani the country is a tangle of hills and valleys, the ranges having a general north and south trend and the hill streams flowing north. The hills reach close up to the Chindwin, and cultivation is all but confined to the narrow fringe of low land between them and the bank. Apart from this fringe, the cultivation north of Kani is found in the valleys of the Thingadôn and Patolôn streams. The first-named drains the northern slopes of the Mahudaung and meets the Chindwin just south of Kin on the northern boundary of the district. The second rises in the forest reserves between the Pôndaung and Mahudaung ranges, near the Alaungdaw Katthapa, a venerated Buddhist shrine, and flows due north, entering the Chindwin below Mingin in the Upper Chindwin District. The cultivated area along this stream is the Sèywa glen, about fifty miles west of Kani, isolated and without means of approach by cart.

East of the Chindwin.

East of the Chindwin the country may be regarded as falling into two portions: the southern contains the area between the Mu and Chindwin rivers. The uplands exhibit the same north and south trend as is noticed west of the Chindwin. On the east the valley of the Mu rises gently to an infertile, often rocky, upland of red soil. The western limit of this upland is the steep ridge which culminates in Kyaukka hill, 1,245 feet in height, ten miles east of Mônywa, and which contains further north other conspicuous hills at Taungtalôn and Ôkpo. On the Chindwin side the main drainage stream is the Tha-te, for the greater part of the year a dry stream bed, on each side of which occur areas of black cotton soil.

The northern portion consists of high-lying, gravelly red soil, rising north-east to the sandy Hnaw forest of Shwebo in a gradual slope which is interrupted east of Kanè by the isolated hills of Natyedaung. The drainage lines run south-west, and the only considerable stream is the Inbaung, a non-perennial stream which meets the Chindwin a few miles north of Kanè.

The Chindwin.

The Chindwin enters the district from the north at Kin, and flows south-east. Until it reaches Mônywa its valley

is narrow, and at Shwezaye, about half-way down, becomes a defile, and its course cannot be materially affected by the process of silting. Below Mônywa, where the valley widens and slopes down on the east, the bed has silted up, and the river annually overflows the adjoining country. The chief outlet is the Ywathit, a natural, unregulated, inundation canal. In the rains the Chindwin has a strong current and varies much in breadth; at Mônywa the flood channel approaches a mile in width. It is navigable for steamers of some size throughout the year.

The Mu. The Mu, a tributary of the Irrawaddy, rises in Mansi in Katha district, runs in a southerly direction, keeping a general course parallel to the Chindwin, and flows into the Irrawaddy near Myinmu in Sagaing district. It forms for some twenty miles the boundary between the Lower Chindwin and Shwebo districts. The course of the Mu is remarkably sinuous, and the stream has in places cut across the chord of the arc formed by its old course, leaving a dry stream-bed available for cultivation. The Mu has no perennial tributary within the Lower Chindwin district, but in the rains numerous torrents drain the high-lying country between the Mu and Chindwin, flowing for a few hours at a time. The chief are the Pèwet on the north and the Wetkè on the south.

The Alaungdaw gorge. The most interesting natural feature in the forests of the west is the Alaungdaw gorge, in which is the Alaungdaw Katthapa shrine. The Paya stream, a tributary of the Patolôn, has cut through the limestone rock and formed a deep gorge with cliffs on either side. Just above the site of the reclining figure of the Buddha, the stream goes underground for a short distance and emerges later in a narrow, deep channel.

Lakes. There are no lakes, properly speaking, in the district, but along the Chindwin there are depressions behind the river bank which fill with water in the rainy season, when the river is in flood, and contain more or less water for the rest of the year after the river has subsided. The most noteworthy of these flooded depressions are in the north of the district, at Kin, Yin, Bônmazin, a little to the south, and Kanè: and there are others at Shabye, north of Alôn, at Letpadaung, opposite Mônywa, and at Thitsein, near Nyaungbyubin.

Diversity of the district. The district presents extreme diversity of feature, of which a few instances may be noticed. The recorded rainfall in the west is over fifty inches, that at Mônywa is twenty-seven inches. Altitudes vary from 222 feet to more than 4,000

feet above sea level. The cultivated soils range from black soil, largely independent of rainfall, to arid gravel-strewn hillsides, and from fertile silt to all but mere sand. Among the standard crops in different regions are the early variety of sesamum, the late variety, white millet, red millet, cotton, beans, maize and several kinds of rice. The same species of cultivation, for instance embanked rice land, exhibits extreme variation of soil. In the north-east of the district, near Kudaw, the rice soil is a thirsty red; south of Mônywa it is silt; in portions of the south-west of the district it is a black clay. The district utilizes almost all the ordinary forms of village irrigation. Natural springs are also used, and there is one variety of irrigation which appears not to be found elsewhere, *i.e.*, the tapping of the subsoil water by means of bamboo pipes. In one part, along the South Yama, there is a considerable number of impermanent irrigation wells. A rice crop is being harvested somewhere in the district in every month of the year except two.

The area given in the Census Reports is 3,480 square miles. The areas ascertained in the year of Regular Settlement were as follows:— **Area.**

	Sq. miles.
Cadastrally surveyed, 1,657,422 acres or ..	2,589·00
Unsurveyed land, outside cadastral survey boundaries but not falling within a reserved forest ...	203·98
Reserved forest	741·00

The total area, 3,533·98 square miles, does not agree with the census figure, the authority for which is not known. In area the district is smaller than many of the districts of Upper Burma, but few have a greater extent of cultivation or a more numerous population.

Surveys.

Triangulation.—Two series of the Great Trigonometrical Survey of India traverse the Lower Chindwin district, *viz.*, the Manipur Minor Meridional Series, connecting the Manipur Longitudinal Series with the Burma Coast Series, and the Mandalay Minor Longitudinal Series, connecting the Manipur Minor Meridional Series with the Mandalay Meridional Series. The former series was observed by No. 24 Party of the Survey of India between 1899 and 1902 and the latter series by the same party in 1899-1900.

Geographical and Topographical Surveys.—A Geographical Survey, on the scale of 1 inch = 4 miles, of the area now included in the Lower Chindwin district was made by Nos. 11 and 21 Parties of the Survey of India between

1887 and 1891. The 1-inch Topographical Survey of the district was carried out between 1903 and 1909 by Nos. 3 and 10 Parties; an area of some 800 square miles in the north-west of the district still, however, remains unsurveyed.

Forest Surveys.—Practically all the reserved forests in the district were surveyed on the scale of 4 inches = 1 mile by No. 20 Party between 1902 and 1906.

Cadastral Surveys.—The Cadastral Survey of the Lower Chindwin district was commenced in 1896 by No. 3 Party, Survey of India, and was finally completed in 1907 by No. 7 Party. The work was based on traverse surveys, and extended over an area of 2,610 square miles comprising 1,606 *kwins* or survey-blocks, and 1,074,343 fields. The scale of survey was 16 inches = 1 mile.

Geology. Little is known of the detailed geology of the district. The rocks are entirely of tertiary age. In the extreme west nummulitic limestones and shales are exposed. These are followed to the east by miocene clays and sandstones, and these again by the soft sandstones which cover the greater part of the district and belong to the pliocene period. On the Pôndaung ridge the principal rocks are limestone and sandstone. Granitic rocks and quartzes occur in places. On the Mahudaung, sandstone is the prevailing rock, but calcareous strata and ferruginous or gravelly conglomerates are plentifully distributed. At the foot of the main ridges laterite and *than kyauk* (iron stone), a kind of hard, black rock, possibly a tuff, are common. Large pieces of the so-called *ingyin kyauk*, or fossilized wood, formed out of petrified *ingyin* (pentacme siamensis) are met with all over the drier areas, especially along the foot of the Mahudaung. The soils in the hills where laterite does not prevail are usually sandy, with interspersed tracts of sandy loams, sometimes approaching clay in appearance.

Petroliferous areas. In the north of the district, on the eastern slopes of the Mahudaung, occur several small escapes of crude petroleum, usually in the beds of or close to streams, which are known as *yenan chaung* (stinking-water streams). Near Yèwaing, where there is a Forest Department fire-protection camp, just below the crest of the Mahudaung, is a *mi-dwin* or fire-hole, which sometimes glows spontaneously in the intense heat of the hot weather. There is no sign of coal, and the incandescence is probably caused by the escape of subterranean gases generated by oil. Petroleum occurs in other parts of the western hills, *vide* Chapter V.

Black-soil areas. There are extensive stretches of 'black cotton' soil. Of these the most important is the nearly level plain between

the Salingyi uplands on the east and the Pagyi hills on the west, between the Yamas. Another important area of black soil lies east of the Chindwin and extends from Nyaunggan in the north to below Mônywa in the south. As with the western tract, the favourite cultivated grain in this tract is millet. Pockets of black soil are found in other parts of the district, but, north of the North Yama on the west and of Nyaunggan on the east, their occurrence is infrequent.

The red soils. But the bulk of the soil consists of red sands and gravels, sometimes interspersed with ferruginous conglomerate, and to this kind of soil are to be assigned all the hilly country east of Kyaukka, most of the country in the neighbourhood of the Chindwin on either bank, and most of the hilly forest land in the west and north of the district.

Volcanic rocks. Opposite Mônywa there is a group of hills formed of petrosiliceous volcanic rocks and other isolated hills, in one of which are the remains of a copper mine which was worked in Burmese times. The output of copper was probably not considerable, as the only traces now to be found consist of a few stains of green carbonate. The presence of volcanic rocks is, however, stated to be interesting as forming a further link in the volcanic chain running north through Narkondam and the extinct volcano of Pôppa, which is a continuation to the north of the great Eastern line of volcanic outbursts running through the Eastern Archipelago.

Explosion craters. A ridge of volcanic rock, forming at its midway point the Shwezaye defile, runs from south-west to north-east, from Lèshe, east of Wazein hill, north of Yinmabin, to Nyaunggan, west of Budalin. In this ridge occur the broken peaks of some extinct volcanoes and, besides, eleven explosion craters. These remarkable geological phenomena have been examined by Mr. R. D. Oldham, *vide* Bibliography.

The compound crater at Lèshe, in the south-west of the line of craters, is one and a-half miles long and has a width of three-fourths of a mile, and is surrounded by a precipitous scarp. The central and deepest basin is 150 feet below the level of the scarp and contains a lake of brackish water. The craters are believed to be due to single eruptions of great violence but short duration. Besides the Lèshe crater, there are large craters at Twin and Taungbyauk, west of the Chindwin, and at Twin, east of the Chindwin. At Twin West, the old volcanic cone and part of the original crater can be traced. At Twin East, there are remains of the old volcanic cone, and the crater pit is 300 to 350 feet

below the level of the scarp. The craters are distributed as follows:—

2 near Ôk-sing.
1 at Twin, east of the Chindwin.
3 at Taungbyauk.
1 at Twin, west of the Chindwin.
3 at Lèshe.
1 more to the west of these, probably a crater.

Total 11

There are no signs of difference of age, and their formation seems to have been subsequent to the cessation of volcanic activity of the normal type. The action by which they were produced appears to have been of the nature of a violent explosion of steam or vapour, unaccompanied by the great heat which is the accompaniment of volcanic activity of the normal type.

Artesian wells. In the neighbourhood of Powindaung hill the soil is marshy, and the subsoil water is drawn off for the purpose of rice cultivation by means of hollow bamboos. Most of the springs appear to be artesian, of the nature of the spring wells in the Gangetic alluvium, but the water in some of them rises appreciably warm, and as Powindaung lies in the line of the explosion craters and extinct volcanoes it is possible that igneous action may account for, at any rate, some of them. The springs do not appear to have been reported on scientifically up to the present. Natural springs also occur, the most noticeable being about a mile west of Lè-ngauk. In this neighbourhood and at Zidaw on the North Yama and Taya, near the South Yama, are quaking bogs, *nagabwet* or *nagachit*.

Saline efflorescence. Saline efflorescence occurs, but not on an extensive scale. Near Yèdwet, in the north-east of the district, there is a marsh which gives to a stream known as the Ye-ngan, or salt stream, a perennial supply of brackish water. The efflorescence also occurs along the course of the Taya and other streams in the angle of country between the Chindwin and the South Yama. In the artesian area round Powindaung the outcrop appears, but not on a large scale, and this is no doubt due to the fact that a good deal of the subsoil water is drawn off through the pipes, whilst the holes dug to receive the pipes facilitate drainage to the lower levels, and capillary action and evaporation are thus minimized. Saline impregnation also occurs around the lakes formed in some of the explosion craters, and is no doubt due to washing down of the salts from the soils forming the inner face of the scarp.

The rainfall varies inversely with distance from the hills on the north and west. The average rainfall at Mônywa (1895 to 1909) was 26·86 inches. *Rainfall and climate.*

The average rainfall at other recording stations is shown in Chapter VIII, and the figures reflect the fact that the district is partly wet-zone. The rainfall variation from year to year is, however, great, and the showers are local, a widespread downpour being the exception. The minimum recorded temperature at Mônywa has been 47 degrees (1905) and the maximum 112 degrees (1908 and 1909). In the dry-zone regions, although the heat in April and May is excessive, the climate is healthy at all times of the year. Under the hills in the west and north malaria prevails in the rains, and the valleys are feverish until the cold weather sets in, when—for the four months from November to February—they enjoy a bracing climate. The climate of the dry portions of the district is stated to be suitable for persons suffering from complaints of the chest. The prevailing winds are from south-west to north-east from the middle of May to the middle of October—the monsoon period—and in the opposite direction for the remainder of the year.

There was a hailstorm in November 1896 which ruined the crops in several riverine villages near Le-mye on the Chindwin, and was so violent as to throw down trees and houses. The occurrence of hailstorms is, however, most usual in the northern half of the district, where they not infrequently occur in March and April.

[The following notes on the wild fauna of the district, indigenous beliefs in regard to animals, etc., have been supplied by Mr. J. P. Connor, Superintendent of Land Records, Lower Chindwin District:—]

All the varieties of wild game found in Upper Burma, except the rhinoceros, occur in the Lower Chindwin district. The localities in which they are found vary according to the vegetation appropriate to each species, ranging from the scrubby thorn jungles of the dry zone to the bamboo-covered and heavily afforested hills of the northern and western humid zone. *Fauna: quadrupeds.*

In the former, *thamin* (brow-antlered deer, panolia Eldi) and hare abound, and barking-deer, pig and leopards are occasionally found. *Thamin* cast their horns during the rainy season, and, when the new ones appear, avoid the society of the does, which spitefully take advantage of their defenceless condition to bite the tender growth. They avoid dense jungle, as the shape of their

horns renders them likely to be caught by creepers, especially in parts where the runs are not familiar to them, and also because they are best able to outdistance their natural enemies in open country, being the fleetest of deer. The hare not only eludes its pursuer by its speed, but also by running along a carefully prepared track, which has apertures bitten through the tangled shrub at the side, through which its pursuer cannot follow with equal facility. When a hare first breaks it runs in a leisurely manner, as if about to stop, but when it turns a corner it doubles its speed, and does not check till it has covered a good distance. When a hare is captured, a Burman will pull off the tip of the tail for luck. The hare has its form under a low tuft of grass or bush, where it makes a smooth bed by beating the ground with its rump.

In the humid regions, which include the hills, bison (Gavæus gaurus), *saing* (wild bull, bos sondaicus), sambhur (rusa Aristotelis), tigers, bears and the goat-antelope are met with. The *saing* is one of the wariest animals that can be hunted. Burmans say that "it teaches the hunter." It is said to be so expert with its horns as to be able to pick a plum off the ground, transfixed on one of the points. It is also said to be unsafe to take refuge from an enraged *saing* in a bamboo clump, however thick, as the beast will overturn it or break it down. A man pursued by a bison is believed to be safe if he lies down flat on the ground, as the beast cannot reach him there, owing to its short thick neck, and generally rushes past, avoiding the prostrate form.

Elephants, leopards, pig and barking-deer occur in both the humid and dry zones.

The tusks or canine-teeth of the barking-deer (cervulus aureus) are considered to be poisonous. When agitated, this deer is said to emit a sound like the chattering of teeth in ague, which can only be heard at close quarters. It is a nervous, watchful creature and, when frightened, utters the bark from which it takes its name. When a deer is pursued by wild dogs it makes for the nearest stream, presumably with the object of throwing them off the scent. It can make a good fight when pressed, and has been known to attack human beings in the last resort, as for instance when caught by accident in a hare net.

In the rains pig rear their young in comfortable nests (*wet thaik*) built of grass. The tops of these are sloped like a thatched roof in order to keep out the rain.

Elephants are considered to be the most sagacious of animals. A herd is protected by sentinels, *kin*, which take

up favourable positions and warn the herd on the approach of danger. A wounded elephant, unable to keep up with the herd, is said to be helped away by its companions, which prop it up on either side, and, if a steep place is encountered, one also pushes from behind.

Leopards usually play havoc in a jungle for a short time, and then disappear. This is accounted for by the belief that they live for one month on water, one month on earth, one month on air, and one month on flesh. When a leopard scratches the earth to sharpen its claws the phrase used is *gananttwet*, it "is calculating," that is to say, it is working out a sum to ascertain where it will meet with its prey. At night, when a leopard scares fowls off their perch in the trees, it is believed to blow them off. Its bite is reputed to be poisonous. The power of the leopard to lead away a large and heavy victim before killing it is referred to as "calling away" (*hkaw thwa thi*). This, no doubt, is effected by the grip on the throat, whereby the head is twisted round and the strain on the animal's neck causes it to plunge madly forward, unable to resist and ignorant where it is being led, until a secluded spot is reached, where it is killed and devoured.

At all seasons the localities where game may be found depend on the prevailing food-supplies—thus, elephants usually remain in the northern forests till the winter harvest approaches, when they come down into the dry zone to share in the harvesting. Occasionally they descend at an earlier date, when the fruit of the toddy-palm is ripe. This they consume, and the seed passes through the alimentary canal intact and may be found after a few days germinating on the ground. Powerful tuskers destroy palm trees by butting and overturning them. They do this in order to obtain the sweet pith at the crown of the tree, known as *htano*, and containing the sap. To get at the core, the elephant splits the trunk by treading on it and hammering it with its fore-legs.

In the same way herbivorous animals confine themselves to the hills during the rains, when their favourite food, the bamboo shoot or *myit*, is available. From October to June they feed at the foot-hills, where grasses and shrubs are more plentiful than on the high hills, which are then becoming arid. They are particularly to be found in these grassy regions in the early rains, when the tender shoots of grass begin to sprout.

Big game has undoubtedly increased since annexation; because of the general withdrawal of fire-arms; but the

lesser kinds, except the brow-antlered deer, are held in check by netting, hunting with dogs, and trapping. There has been a marked decrease of wild pig in recent years, owing, it is said, to epidemics of rinderpest, contracted when disease has prevailed among domestic cattle. Brow-antlered deer have increased, but the proportion of does is steadily outgrowing that of stags, since the latter are easily shot down from carts with the accurate modern rifle of long range, with the result that mature stags are insufficient in point of numbers, and herds are seen with immature stags or none at all. In Burmese times the native hunter did not discriminate between the sexes, but shot what offered the best target (just as he does now when he has the opportunity), and the does, being more numerous and confiding, suffered most, but the proportion of males to females was not disturbed. This variety of deer does great damage to the sesamum and bean crops: particularly the does, since they are bolder than the stags owing to the protection they receive. The stags, seeming to be aware that their horns attract attention, keep out of the way of man. It is stated that it would save the cultivator's crops and improve the breed of deer if a certain number of useless does were removed.

Reptiles and lizards.

The reptiles include many kinds of snakes, some of which, such as the *linmwe*, the common rat-snake, are occasionally eaten. The flesh is said to taste very much like fish. The poisonous snakes include the Russel's viper (*mywe-bwe*), cobras (*mwe-hauk*) and several kinds of hamadryad—*ngandan*, the banded hamadryad; *ngan-thangwin-zut*, the chain-pattern hamadryad; *nganbôk*, the dusky hamadryad; *nganwa*, the yellow hamadryad—and others. These are found chiefly in the hills. The Russel's viper is, as its name implies, viviparous, and Burmans believe that the young, when mature, eat their way out of the mother's body and so cause her death. In hot weather this snake frequents sandy places, and is especially fond of lying in the deep dust of roads, and is a source of danger to passers-by. Hamadryads are dreaded, as they are aggressive, the popular idea being that if one is destroyed its mate will sooner or later come to avenge itself on the aggressor. There are many other kinds of snake, poisonous and non-poisonous. Some of the non-poisonous and fangless snakes, such as the common rat-snake, are classed by Burmans as poisonous; and the poison is said to be of a very deadly nature, the popular belief being that, when a thin-skinned animal is bitten, the poison, not being deep-seated, is washed

out by the rush of blood, but, when a thick-skinned animal like a buffalo is bitten, the result is fatal, as there is no bleeding likely to wash out the venom. The poison of this snake is even said to be more deadly than that of the cobra, but it is nevertheless considered useful to have one about the house, in order to keep the latter reptile away. How little truth there is in this statement may be gauged by the fact that a cobra has been killed * which contained a large rat-snake which latter had previously swallowed a trout-spotted lizard! The *sabagyi*, or boa-constrictor, is a handsome snake and grows to a large size. It feeds on animals up to the size of the barking-deer, but is not known to have injured or attacked human beings. It is believed to secure its prey through fascinating its victim by displaying its navel. This belief no doubt reflects the fact that the snake is rampant and ready to strike when its unwary prey walks within its reach. In the hot weather, when the jungles are burnt, this snake takes to pools, where it lies submerged and secures its prey when it comes to drink. In talking of poisonous snakes Burmans, from superstitious motives, refer to them as *po*, worms. Snakes are reported to make a chirping or whistling noise, one of these calls resembling the chirping of a carpenter beetle. There is a cliff on the Chindwin river, to the south of Yin village, known as Mwe-paing Taung (Severed Snake hill). The fable runs that a mythical snake was cut in two, the head falling down- and the tail up-stream, which accounts for the fact that poisonous snakes are common below this point, but even when found above are comparatively innocuous. The same legend accounts for the belief that Kani has no snakes, while Kanè on the opposite bank is infested.

The lizards include the *taukte*, or trout-spotted lizard, three varieties of iguana, *hputmwe*, *hput-hnyin* and *hput-gya*, and the *hpadat*. The black variety of trout-spotted lizard (Gecko guttatus) is believed to be exceedingly poisonous, and mysterious deaths are attributed to it if no signs or traces of a snake can be found. It is essentially a climbing lizard and, if one is caught and liberated on an open piece of ground, it will invariably run up the legs of the liberator, as the nearest object up which it can scramble to imagined safety. It is said to be overcome by the odour of new onions, and can be stupefied and captured by the application to its nose of an onion fixed on the

* By the contributor of these notes.—J.P.H.

end of a stick. At first the lizard retreats and lashes its tail, but gradually offers less resistance, and finally runs about aimlessly. The *hputmwe* is believed to cause great poverty in any house into which it may climb. It is edible, and its eggs also are considered a delicacy. They are deposited in the nest of the white ant, or termite, during the rains. The lizard scratches a hole and enters the ant-hill, and deposits twelve to fifteen eggs in the midst of the ant larvæ; these serve the young lizard, when hatched, for food, and the mound at the same time affords the young ones ample protection till they are strong enough to force their way into the outer world. After laying its eggs, the lizard leaves the mound, carefully plastering up the hole of exit and entrance. This appears to be done when the earth has been moistened by rain, as claw marks can be seen on the surface and serve to identify the ant-hills in which eggs have been laid. Burmans are expert at detecting such an ant-hill. The *hpadat* (Liolepis guttatus) is another edible lizard. It lives in holes in the ground, and has to be dug out to be captured. The tail is particularly fleshy, and is the portion favoured by the Burmese gourmet. The lizard is met during the day feeding on insects, which it secures by darting out a snake-like tongue, to which its prey adheres. When disturbed it raises its body off the ground and runs rapidly to the shelter of its hole. At the beginning of the rains these lizards are hunted with dogs, since the holes are water-logged and it is easy to dig them out Occasionally dogs are seen digging them out for their own benefit. Two kinds of tortoise are found. They are eaten, and the shells are used for ladling or measuring out oil. Turtle are found in fields and tanks. They and their eggs are usually discovered by following their tracks; but in some cases dogs are used to track them by scent.

Game birds. Amongst game birds, jungle-fowl (Gallus ferrugineus), partridge (the Chinese francolin) and two or three varieties of quail are found in the plains. In the hot weather, when jungle-fowl frequent waterless places, Burmans believe that they suffer no inconvenience from thirst, as the smooth round pebbles found in their crops turn into water. It is at any rate remarkable that jungle-fowl that are unable to obtain water during the hot season are hardier and more tenacious than those found near it; the latter after a flight or two on a hot day become exhausted, and may be run down by men or dogs. The migratory birds include two varieties of geese (the bar-headed goose and the grey-leg

goose), two varieties of snipe (fantail and pintail), golden plover, and several varieties of duck and teal, which arrive in December and leave again in March. These. birds are supposed to retire to the Himawanta Forest, the Himalayas, in order to observe the Buddhist Lent, and jungle-fowl too are said to observe Lent during the rains, when they moult, since during that season the cock is seldom heard to crow. Besides game birds, certain hawks and other birds are seen to migrate in large numbers, and are considered by the people to be of a superior nature to those that do not. The perching goose, whistling teal, cotton teal and spotted-bill duck do not migrate, but breed during the rains in tanks and swamps. The perching goose builds its nest in hollow trees. The game birds in the humid forest regions comprise the pea-fowl, two kinds of pheasant—argus (*daung-min*) and kalig (*yit*)—imperial pigeon (*hnget nga nwa*) and green pigeon (*ngu*), as well as jungle-fowl and partridge.

Predatory birds.

The fish eagle, known as *hnget ta-nga*, the fisherman bird, is the largest of the predatory birds. It frequents backwaters and lagoons, and makes its nest on a large tree near the water's edge. It seizes fish, and occasionally birds and small animals, darting on them from above whilst on the wing.

The next in size is the *linyon*, a forest eagle which is very common. This bird preys on jungle-fowl and hare, and other small animals and birds. Its method of hunting is to sit silently on a stump or branch until its prey emerges well into the open, when it is pounced upon. This bird might be useful in countries where the rabbit is a scourge, as it confines itself to forests and is not large enough to carry away lambs and kids. The *thein* is a large falcon, swift on the wing, which preys on small animals and on birds up to the size of a hen. It does not shun human abodes like the *linyon*, and is destructive to poultry.

There is also a smaller falcon which is found in the dry tracts. It feeds chiefly on snakes and, as it destroys large numbers of these pests without harming poultry, it should be protected. A nest was found containing two young ones, with a snake hung across the branch, and the young ones were fed from the snake from time to time. This precaution of keeping a supply of food for the young ones would indicate that the bird is not able to count on a regular supply, and the comparison of the European shrike may be noted. In dealing with a large snake this bird has been seen parrying the darts of the snake with its wings, and at the same time striking the snake with them, until it has

secured a hold on the neck or head. When the snake is a large one, the body and wings of the falcon are sometimes implicated in the coils of its victim, and it is temporarily unable to fly. A smaller variety again is the *gyothein*, the dove hawk or sparrow hawk, which preys on small birds. Its tactic is to get a plover or pewit out in the open and pursue it until it is exhausted. The victim flies in a zigzag course screaming with fear, endeavouring to avoid the swift darts of its pursuer, but is overtaken unless it can reach the cover of bushes where it can hide and run away, the hawk being unable to follow owing to its clumsy talons. This hawk has been seen to single out a crow from a flock flying across a river to roost, and, after one or two manœuvres, strike it with an impact that rendered its prey powerless, and victor and vanquished fell on to a sandbank in mid-stream. No doubt the falcon had chosen its ground with this object in view. There is also a pied hawk which ranges over grass lands and fields and picks up rats and insects. Amongst owls, the largest is a forest owl, *hngetso-gyi* (bird of ill omen), a term which is, however, applied to all owls and night jars, since they are said to cause death by the circumstances under which and the number of times they call. The next in size is the *didôk*, or horned owl. Others are the *zigwet*, or screech owl, and the *myinwun* owl. The jay, *hngetkha*, and crow-pheasant, *bôk*, also feed on insects, lizards and snakes, while the latter also attacks small animals such as young hare.

Hunting: indigenous methods. There are no special rules regulating the hunting of wild animals in the district, and those in force for the Province generally apply. There are no professional hunters, and the wholesale vend of flesh and feathers is unknown. No attempt is made to capture elephants. Animals are taken in nets of various kinds according to their size, and birds and small animals are occasionally shot with a cross-bow, *du-le*. As the range is limited, the hunter lies concealed in an ambush made of leaves and branches (*ôn*). Nets for the capture of pig and small animals are made of half-inch mesh in a convex shape and are about two yards in width. Several of these are fixed up at the end of converging hedges and the jungle is beaten towards them. A hunter sits concealed a short distance in front of each net, and when an animal has passed him he jumps up and shouts, and the noise causes the game to dash blindly into the net, in which it is enveloped, rolling over and over in its struggles. The hunters, who are armed with pitch-forks (*hmein*) or spears, then rush up and despatch the quarry.

For the capture of brow-antlered deer, an undertaking not often attempted, long and high nets are used. The netting of hare is common, and is either done by driving the hare towards the nét, or by waiting for it to descend to its feeding ground at nightfall. In either case low hedges are made, in order to guide the animal towards the net, and it follows these without attempting to jump them. The net used for night-snaring resembles a tennis net. The lower edge is pegged out taut and the upper edge is pursed over and propped with slips of bamboo. As the animal's scent and hearing are keen, the hunter takes up a carefully-screened position near by. In advance of the net a thin line is fixed, and to this is attached a bell still further in advance. When the hare leisurely approaches the net it touches the invisible line, which causes the bell to ring behind it, and it rushes forward into the net. The impetus of its rush displaces the bamboo props, and the top edge of the net falls over, enveloping the hare. Sometimes the hunter supplements the effect of the bell by throwing a stone after the hare. Hare are also hunted with a dark lantern (*mi-ôk saung*) by means of which large numbers can be destroyed in a single night. They are also noosed at favourable apertures in hedges. By blowing a doubled leaf, *hpet hmôk*, to imitate the call of a young barking-deer, deer and other animals may be decoyed to close quarters, when the hunter, who is in hiding, shoots at them with a cross-bow or gun. In villages where nets are found, barking-deer and pig are naturally scarce.

Snake-charming, as understood in India, is not practised in the district, but it is believed that certain devices can be tattooed on the skin, so as to confer immunity from the effects of snake bite, when the person tattooed can handle deadly serpents with impunity.

European methods.

The district offers moderate attractions to sportsmen. For brow-antlered deer, the season commences in February and closes in May, before which month the horns are not clear of velvet. For bison and wild bull, the best time is from June to September, when they are feeding on fresh grass, and, later on, on bamboo shoots; but these animals can only be shot in the remote Pôndaung hills in the west, where supplies and transport are difficult to obtain.

Game fish.

The sporting fish comprise the *nga-gyin* and *nga-myin*. Besides angling for small fish, the Burmans have two methods of fishing known as *nga-sin-daing-htaung* and *nga-sin-yaik*. In the former method, by which the *nga-gyin* is often taken, a baited line is attached to a float of

bamboo. The fisherman watches from the bank until he sees the float disturbed, when he pursues it in his canoe and, after securing the end of the line, plays the fish. The latter is a nearer approach to fly-fishing. A long line attached to a rod is used to whip the water. Throughout its length the line is baited with hooks and tufts of cock's feathers. This is swung round and pulled up the current; the *nga-myin*, which is a voracious feeder, is the chief fish taken by this method. In lakes, fish are also taken on lines baited with small live fish, which are hooked by the dorsal fin.

Trade. There is no trade in fur, feathers or skins, but travelling agents go from village to village and buy up the horns of brow-antlered and other deer. Most of these are shed horns, whilst a few are the horns of animals killed by wild dogs, the carnivora, etc. Few, if any, belong to animals that have been shot, as the horns of these are kept as trophies.

Superstitions. Some superstitions and fancies have been mentioned above. A few others may be added. The tiger is looked upon with superstition, and is usually supposed to be the embodiment of the local *nat*, or spirit of the forest. The tiger does not interfere with human beings unless they have in some way offended the *nat*. The *nat*, for instance, objects to a cooking-pot being used instead of a dipper for the purpose of taking up water from a stream. Wood for fuel must not be partially dragged, but must be carried clear of the ground. Besides roaring, the tiger has a shrill call resembling the bell of the sambhur. This call is said to be used as a decoy. In the jungle, Burmans are reluctant to use the word tiger and refer to the animal as *hinmyo* (curry), to express a contempt which they are far from feeling. A band of wild dogs in chasing its quarry is said to distribute itself on either flank, one or two only following on the line of the scent in order to keep the animal on the move. These by their yapping inform the flanking parties of their progress, and thereby enable them to take short cuts and intercept the quarry, should it swerve to either side. Wild dogs bite out the eyes of their victims at an early stage in order to render them helpless. When bells are rung in a monastery and the dogs howl in chorus, their sympathy is ascribed to the fact of their being near man's estate (*lu bawa ni bi*), in accordance with the Buddhist theory of transmigration.

The pelican is popularly supposed to live on the froth which is seen floating down large rivers. If this bird is required for food, it should be well beaten before being eaten, to prevent it resolving into froth.

The pea-fowl is said to have four annas weight of gold in the feathers of its tail. This represents the accumulated gold dust picked up by the bird in the sands of hill streams.

The pewit sleeps on its back at night with its feet upwards, in order to keep the sky from falling on it.

Monkeys come down from trees during the night to see whether the earth is still in its place, or has slipped away. It is on these occasions that they fall an easy prey to the leopard.

The hoopoe, *taung bizu*, is said to call out when asleep and so deceive the wild cat, which fancies the bird is awake and does not waste labour in stalking it. When awake, the hoopoe is silent but watchful, and the wild cat stalks him, but in vain.

The life history of the loris, a species of sloth (*myauk lè pwe*), is hinted at in its name. It is originally a mole (*pwe*). As it burrows under the earth it finds its way into the hollow of a bamboo, and continues to burrow till it comes out at the top. It then becomes a monkey (*myauk*) to suit its new environment. This creature may be beaten to death, but on a puff of wind passing over it, it is restored to life. It can escape from a cage when a strong wind blows.

Butterflies originate from the leaves of certain trees; one of these produces the swallow-tail butterfly. As a matter of fact, the caterpillar feeds on the leaf and undergoes the usual transformation before emerging as a butterfly, but the Burman is not aware of the transition, which he has never watched closely.

If a dove's nest is discovered, the bird is said to remove its eggs to a new hiding place by placing them on the end of a twig, to which moist clay has been applied in order to make them adhere. The bird flies away holding the eggs, so balanced, in its beak.

A powerful charm used by hunters to attract the carnivora is to cut the tail off a kill and stick it like a flower in one of the ears, which is slit for the purpose, *naban hto*. The charm is so effectual that the animal is immediately attracted and the hunter must lose no time in concealing himself.

The armadillo or ant-eater (*thein ko gyat*) is said to repeat the names of persons that it has heard shouted in the jungle, and if the unwary owner of the name responds he will inevitably die.

The carnivora are said to satisfy the cravings of hunger by eating a whitish clay (*chit*) when their natural food is not available.

The *thaliga* or hill myna (eulabes Javanensis), which learns to speak in captivity, is said to possess this power even in its wild state, and to bewilder men who traverse dense jungles by making them think that they are being addressed by human beings or *nats*.

CHAPTER II.—History and Archæology.

History.

Early history. Few details of the early or even the more recent history of the district have come to light. What is now the Lower Chindwin district was no doubt part of the kingdom of Burma from early times, but no special mention of it appears in the history given in the *British Burma Gazetteer*, although it must have been many times traversed in the marches and counter-marches of early expeditions between Burma and Arakan.

There are some allusions to the district in the *History of the Alaungpaya Dynasty*, written by Maung Tin, A.T.M.

At the beginning of Alaungpaya's reign, in 1752, Kyaukka, Thazi, Alôn (Badôn), Amyin (in Sagaing), and Tabayin in Shwebo, joined Talaings who had escaped from the Talaing garrisons in Upper Burma on Alaungpaya's accession to power, and rose against that monarch. They entrenched themselves at Tèdaw in Shwebo, but Alaungpaya despatched a flying column in their rear, burnt Alôn, Ngapayin and Kinzan, both east of Kudaw, the Burmese contingent deserted, and the Talaings in the garrison were easily overcome. Some of the Talaings fled to Kyaukka, but were massacred by the Burmans of that place. Alaungpaya left garrisons in the villages east of the Chindwin, appointed headmen, and took oaths of allegiance.

There was another rising in the following year. Yazadirit, a Talaing who had been living at Indaing, fearing arrest at the hands of the new garrisons, went to Mingin, collected a following and proceeded downstream as far as Kani, burning the villages on either side of the Chindwin. He was joined by the feoffee of Kinu, who had risen against Alaungpaya and been defeated by the Nyaunggan garrison. The commander of that garrison received orders to proceed against the two rebels, but did not encounter them, and they fled first to Thitkauk (possibly the place of that name in the Sèywa), then to Kyaukka (in the Yaw subdivision of Pakôkku) and finally to Taung-u.

The expedition of Alaungpaya to Manipur, undertaken in 1758, traversed the Lower Chindwin district, and Thitsein

(near Nyaungbyubin), Mônywa, Wunbo—where he established a military base.—Kani and Bônmazin, south of Kin, are mentioned as halting places.

Bandula, a native of Ngapayin village near Kudaw, in the north-east of the district, was one of the principal leaders in the Burmese invasion of Arakan which was the direct cause of the First Burmese War. He was killed at the taking of Donabyu in April 1825. His son, Maung Gyi, received the same title of Maha-Bandula, commanded the Burmese forces in the Second Burmese War, and surrendered at Rathemyo in October 1852

In 1837 Maung Taung Bo, Governor of Pagyi, "a notorious robber" (*British Burma Gazetteer*, Volume I, page 351), is mentioned as being placed in charge of Ava on the rebellion of Prince Tharrawaddy, and it has not passed out of recollection that men from the Lower Chindwin joined the unsuccessful rising of the Myingun Prince against King Mindôn in 1866.

Maung Po, a physician of King Mindôn, and a native of the district, founded the anticlerical sect of the Mans in 1856. He taught that there was no obligation to support the Buddhist Order. The sect was proscribed in Upper Burma, and its founder was arrested and impaled.

Here and there in the later history given in the *Gazetteer of Upper Burma* occur military titles of officers of infantry corps recruited from the district. The Kinwun Mingyi, Warden of the Marches, who took a prominent part in the events of the reigns of Mindôn and Thibaw and whose death occurred recently, was—it may be noted—a native of Mindaingbin in the south-west of the district. Save for these few echoes of great events, its history is, at present, a blank. It is a matter for surprise that a district which recruited the major portion of the infantry forces of the late Burmese Kings should have left so small a mark in the records. Practically all that can be said at present is that in the middle of the sixteenth century it formed part of the kingdom of Ava, that it was involved in the downfall of that kingdom before the Peguans about 1740, and shared in its restoration under Aungzeya, known in history by the royal title of Alaungpaya. No doubt troops from the district took part in the operations of the First Burmese War, and in the operations of 1852, but the particular part they played has not been discovered.

History after the annexation of 1885.

For a detailed description of the causes which led to the organized dacoity of the years succeeding the last annexation of 1885, and of the conditions of jungle warfare in

Upper Burma, a reference may be made to pages 147—155, Volume I, Part I, Sir J. G. Scott's *Gazetteer of Upper Burma.* The Lower Chindwin district shared to the full in the disturbances, a contributing cause being the fact that the district was familiar with the use of arms, as it had in Burmese times supplied the twelve regiments of the Outer and Inner Brigades. In the paragraphs which follow, an attempt has been made to focus the chief seats of disorder and to show how each came to be pacified. The source of information is the *Gazetteer of Upper Burma,* from which extracts have been made, often *verbatim.*

(a) East of the Chindwin.

One of the most prominent dacoit leaders was Bo* Hla U, who maintained himself persistently throughout 1886 in the tract of country which now forms the southern border of Shwebo, the north-west of Sagaing, and the south-east of the Lower Chindwin. The leaders on this side were mostly old-established dacoits, and they instituted a very effective system of terrorism. The Chindwin Military Police levy, over 500 strong, arrived at Alôn in July 1886, and was distributed in posts in the Alôn subdivision, and was continuously employed in the pursuit of Hla U and his followers, Min O and Tha Pwe. The last-named was killed in August, but the north-west of Sagaing district beyond the post of Myinmu on the Irrawaddy, and the south-east of the Lower Chindwin, remained practically in the hands of robber bands. Vigorous efforts were made in 1887 to capture Hla U. Four columns operated in the triangle between the Irrawaddy and the Chindwin. Several camps were surprised, and Hla U was pursued for miles by mounted parties, but always escaped and always reappeared. Eventually, in April 1887, he was killed at Wadawma, near Ayadaw, by one of his own followers, Bo Tôn Baing. The occurrence seemed to promise the breaking up of the band, but his lieutenants, among whom the chief were now Nyo O, Nyo Pu and Min O, remained, and after a slight appearance of calm, and notwithstanding that numerous bodies of troops were in continual pursuit of them, they steadily gathered strength, and the people remained as little inclined as ever to put their trust in British authority. Myinmu, where there was a military and police garrison, was twice attacked and partly burnt, in April and May 1888. Full use was therefore made of the Village Regulation. Villages which fed the gangs were removed or fined. Relatives of dacoits furnishing supplies or information were

* Bo = military official, a leader.

also deported, until the dacoits were surrendered or captured. The process was slow but effectual. The dacoits had no rest in the forests and no refuge in the villages, while clemency was freely extended to all except the most heinous offenders. Disarmament of the people and restoration of a limited number of guns only accompanied these steps, and by the end of 1888 many leaders, including Nyo O and Nyo Bu, had been killed, and many others, including Min O, captured, and most of their followers had surrendered. By the end of the rains of 1889 all the large gangs in the east of the district had been broken up.

(*b*) West of the Chindwin: the southern portion.

The portions of the district which now form the Salingyi and Palè townships in Burmese times constituted the Pagyi *nè*, or Governorship, and an outlying portion of the Amyin Governorship. Pagyi remained uncontrolled throughout 1886. Much of it was in the hands of a pretender calling himself the Shwegyobyu Prince, who had formerly been a vaccinator in Lower Burma. At the close of the year the Kani *wun*, or Governor, who had been continued in office from Burmese times, was murdered by dacoits under Bo Po Tôk at Myogyi, near Yinmabin. Punitive expeditions dispersed the gang which had murdered him, and there was a skirmish near Kyadet on the South Yama, in which Po Tôk is supposed to have been killed, but the country was far from quiet, and in October 1887 a serious outbreak took place. The Shwegyobyu Prince had held during 1886 a position at Kanlè, near the Pahkan (Pakôkku) and Chindwin border. He remained here undisturbed for some time, and when he was driven out corrupted certain honorary constables in Pagyi. Mr W. T. Morison, the Deputy Commissioner, was wounded in an attempt to capture one of the renegades and a few days afterwards an attack was made on the pretender at Chinbyit on the North Yama. There was a stubborn fight, in which Major Kennedy, of the Hyderabad Contingent, and Captain Beville, the Assistant Commissioner, were killed (*vide Minor Articles*, Chinbyit) and two sepoys wounded. The dacoits, however, left forty dead, and several of their leaders were killed. This effectually put an end to disturbances for nearly a year, but the seeds of mischief remained. Towards the end of 1888 another attempt to excite a rising took place, but the ring-leader, a pretender calling himself the Naga Bo Prince, was arrested at Mônywa, tried, and executed. Military Police were sent into the glens bordering on the Pakôkku district on the west, and the disaffected persons moved across the hills into the Yaw valley of that district, where their attempts

to disturb the villages were the cause of special operations in 1889. Some of the rebels had, however, been driven back into the Lower Chindwin district, and these, under Bo Saga, immediately began to give trouble. A Military Police post was therefore established close under the hills at Zeiktaung, and a special officer successfully brought the tract to order. Bo Saga was hunted down and killed by a party working under the Township Officer of Western Pagyi, a nephew of the Kinwun Mingyi, and his gang surrendered and gave up their arms By the end of 1889 fifty dacoit leaders had been killed or captured or had surrendered. Only one notable leader—the Shwegyobyu Prince—remained out, and he had been driven to take refuge in the unadministered hill country inhabited by the Chins.

(*c*) West of the Chindwin: the northern portion.

In Kani, the Burmese Governor had been continued in office, and had from an early date kept order with the help of irregular levies, and the records contain no account of disturbances in this part of the district.

(*d*) Along the Chindwin.

Along the Chindwin itself, pacification was an easy matter. In February 1886 a Deputy Commissioner was established at Alôn. The country in the immediate neighbourhood of the post was first settled, and in April a garrison arrived, and was followed in July by the Chindwin Military Police levy. Pacification continued along the river, where the villages at no time gave trouble.

Serious disorder may therefore be said to have been confined to the south-east and the south-west of the district, and to have terminated by the close of 1889, when the district became, as it has remained, one of the most peaceable in the Upper Province.

Archæology.

The antiquities of the district have not been examined in detail, and no reports exist.

In a note contributed by Mr. Taw Sein Ko (*Census Report of 1901*, Volume XII, Burma, Part I, Report, page 32) it is stated that the Chindwin valley is full of ancient historic sites. Unfortunately, no record of these ancient sites has come to light. There are remains of an old walled city (Kan) on the North Yama, but no history is extant. Taya, near the South Yama, was once a *myo*, or walled town, and the remains of the wall exist. The remains of other walled towns can be traced at Kani and Sinshin.

The chief village in nearly all the old Burmese circles of villages preserves a copy of the Register of 1145 B.E. or of that of 1164 B.E. (A.D. 1783 and 1802), called for by King Bodawpaya from every jurisdiction in the Burmese Empire. As an example, the Register, *sittan*, of 1145 B.E. of Taya village may be given. After reciting the boundaries of the Taya village-lands, it continues:—

The Register of Taya.

"From rice land bestowed as a gift on the Church, the Church dues are one-tenth of the outturn, and there are, in addition, the writer's fee, the grain-dealer's fee and the village headman's fee, one basket of unhusked rice to each. On lands cultivated with dry crops, the Church dues amount to twice the amount of the seed sown, and there are similar additional dues. The State revenue is collected from Royal lands at the same rates, and there is a customs duty, on all food-grains sold, one-hundredth part of the value. The mortgage money payable for a slave is one viss* of silver: the purchase-money is three times that amount. For every ox and buffalo sold the customs due is one-eighth and one-fourth of the value respectively. Raw cotton pays one viss for every cart-load sold, and earthenware is mulcted in the fine of one pot for every cart-load For every basket of pickled tea sold, the headman claims half a viss of the leaves as his due. One-twenty-fifth of the value is the duty leviable on all other sales, and half the receipts go to the captain of the militia regiment which recruits from Taya village. When a head of cattle dies, the headman's share is one rump and one rib. In litigation over cattle, half the court-fee goes to the headman and half to the captain of the regiment. Within the jurisdiction are the villages of Nyodôn, Mwedôn, Tanè, Hlawga, Inmati and Ngayaukthin, and all criminal cases from all these villages are triable by the Taya headman, to whom are payable fees for his presence at the taking of the oath, or at trial by the ordeal of eating rice, or of immersion in water."

There are some widely celebrated and many locally celebrated places of religious interest. To the first category belong:—

Places of religious interest; the Alaungdaw Katthapa.

(1) The *Alaungdaw Katthapa*, situated near the watershed between the Patolôn and North Yama streams, in the western forests, *vide* Chapter I. Pilgrims from all parts of Burma visit it, usually in February and March. The following account of its history is given:—

Maha Katthapa, the Buddhist monk who conducted the first synod held after the Buddha's death, with the

* 3·65 Pounds

co-operation of Azatathat, King of Yazagyo (Patna in India) in 543 B.C., came to Burma, where he died, expiring upon a bedstead made for him by the *nats* (spirits) in a forest cave where the shrine now is, and where there was then the shrine of an earlier saint. There was a single door to this cave, and that the *nats* closed with a rock, to prevent savages and heretics from desecrating the corpse and despoiling it of the precious offerings that had been brought and placed near it. A rest-house was, later, built near the cave, and a reclining image in the likeness of the dead man was placed on an ornamental bedstead inside.

The lithic inscription relating to the Alaungdaw is printed in Volume II of the *Bodawpaya Inscriptions.*

The Powindaung caves. (2) *The Powindaung cave temples.*—The south-eastern slope of the Powindaung, a range of hills running east and west, at a few miles' distance north of Salingyi, contains a great number of images of the Buddha, placed in recesses hollowed out of the sandstone rock of the hillside. The hill is honeycombed with these caves, and new ones are constantly being excavated as works of merit. The hill possesses great antiquarian interest; some of the Buddhas are of old date, and the ceilings and walls of the recesses contain early examples of mural painting. The antiquities do not appear to have been examined scientifically, but an expert report would doubtless disclose material of archæological value, and in the interests of the preservation of early forms of art, it might be desirable that the caves should be placed under control. The recesses are said to contain four hundred and forty-four thousand four hundred and forty-four images of the Buddha. Pyumin and Pyônmin, Princes of the Pagan dynasty, commenced them. The legend of the hill is recounted at length in the article *Lower Chindwin* in the *Gazetteer of Upper Burma*, Part II, Volume II.

Pogadas. To the second category belong the following pagodas:—In Mônywa township, the Shwekuni, at Kyaukka; the Shwegu, at Alôn; the Sutaungpyi, at Mônywa. In Budalin township, the Sinyan, at Sinyan; the Wetye, at Wetye; the Myakundaung, at Maungdaung; the Myatheindaw, at Ye-budalin; the Shwe-hmôkdaw, at Wunbo; the Sagaing Wun, at Nyaunggan; the Pôndu, at Lèmun; the Payagyi, near Thakuttanè. In Salingyi township, the Shwemyindin, at Kyaukmyet; the Shwe-zigôn, at Paungwa; the Shwe-myôzu, at Kyadet; the Sithupan, at Salingyi; the Shwe-zigôn, at Lè-ngauk; the Shwe-sawlu, at Myogyi; the Shinma-nandaung, at Taya. In Palè township, the Shwe-

zedi, at Mônthwin; the Shwegu, at Kyinin; the Payanè, at Sinshin; the Sinmyayin, at Palè; the Neikban Seik-u, at Mwedôn. In Kani township, the Shinbin-yatgyi, at Kani. Other less important pagodas are at Thazi, Myobaw and Bawga in the Mônywa, and at Yeyo in the Budalin township.

Inscriptions.

The following list of pagodas, with lithic inscriptions, has been supplied by Mr. Taw Sein Ko, Superintendent, Archæological Survey. The original inscriptions are engraved on tablets of stone, which were in Burmese times placed within the precincts of the Arakan (Mahamuni) pagoda in Mandalay. Transcriptions have been printed in the published *Collections of Inscriptions*:—East of the Chindwin, the Tada-u pagoda at Ma-u-gyi; the Môk-htaw at Ma-u-ngè; the Maung-pato at Thitsein; the Shwe-guni at Kyaukka; the Tayindaing at Tayindaing; the Pauk-hmôkdaw Pônmasè at Ma-u-gyi; the Thazi at Thazi; the Thalayaung at Wayaung; the Thathana-thawbani chapel (*thein*) at Maungdaung. West of the Chindwin, the Mahapeinne at Ywalin; the Shwezedi Shwegu at Pyaungbya; the Shwezedi at Lè-ngauk; the Kadin at Yemein; the Shwesawlu at Myogyi; the Taungsin at Salingyi; the Pôndaunggyi at Pôndaunggyi; the Teinban at Padauk-kaung; the Kundawbyin at Panywa; the Labo at Labo; the Kadin at Kani; the Alaungdaw Katthapa; the Theindaw Htehlaing at Ngakôn; the Powindaung (bell). The dates of the inscriptions range from B.E. 416 (A.D. 1054) to B.E. 1165 (A.D. 1803). The inscriptions at Thazi, Pyaungbya and Myogyi near Yinmabin mention the dedication of slaves, those at Thazi being foreigners.

Folk-lore: the Bodawgyi legend.

Much of the tradition of the district centres round Bodaw-gyi, or Batha-gywè, and introduces the Buddhistic revival of the eleventh century A.D. Bodaw-gyi was the son of the king of the island of Thitala and, on their father's demise, he and his brother contested the succession. Batha-gywè was defeated, and the younger brother, Pataikaya, ascended the throne. The elder entered the service of Anawrahta, King of Pagan, won his way into favour, and was allowed to assume the prerogatives of a king under suzerainty and to choose his own capital. He proceeded up the Irrawaddy and Chindwin; captured a white elephant, Nga-yan-aung, at Sinbyu-gyun; landed at Kinmun, now on the Sagaing side of the Lower Chindwin border, and was presented with the skin of a lizard, out of which he made a drum. It was on this occasion that he met a maiden selling cakes and made her his queen, after

the fashion of Cophetua and the beggar maid. Mônywa means the village of cakes and commemorates the incident. Continuing his march, he fixed on Kyibadôn (Badôn or Alôn) as the site of his palace. Every three years Batha-gywè paid tribute to Anawrahta and, after that monarch's death, to his successors up to the time of Sawmunit, when he refused tribute. Sawmunit marched on Kyibadôn and surrounded the place, but Batha-gywè mounted Nga-yan-aung, beat on the magic drum, and routed Sawmunit and his army. Sawmunit then employed Brahmans to win the ear of Bathagywè. They came to his court and persuaded him to cover the drum with another kind of skin and to cut off Nga-yan-aung's tusks. Sawmunit again attacked Kyibadôn, and this time with success. Batha-gywè fled to Salun, a few miles north of Alôn on the Chindwin, was closely followed, and threw himself into the river, where he and his company, thirty-seven in number, perished. The further development of the legend will be found in the paragraphs on animistic worship in Chapter III. The same legend, with variations, is told of Kani, but the founder is there styled, not Batha-gywè, but Kani Nawrahta or Myinbyushin, Lord of the White Steed, from the colour of the horse on which he sought death by leaping from the precipitous ridge above Kani into the river.

CHAPTER III.—The People.

The main stock.

The people of the district belong to the main Burmese stock, of which the *British Burma Gazetteer* writes (Volume I, page 142) :—

"However much the details of this enforced emigration as given in the native histories may be unhistorical interpolations, it appears clear that the Burmans are of a kindred race with the Thibetans and originally come from Thibet."

As to the route which that shadowy migration followed, opinions vary, but the traditional route from the north-west is the most likely (*Upper Burma Gazetteer*, Part I, Volume I, page 483). Whether the immigrant body crossed the hill-ranges in the north, where they drop to the Hukawng valley, or to the south, through Manipur, the fertile valley of the Chindwin would offer an early halting place.

Traces of admixture of other races.

Hardly any definite trace of admixture of races within the district presents itself at the present time. Under the Pôndaung hills in the west there are remembrances of occasional colonization by Chin tribes, and the inhabitants

of these isolated valleys speak the Burmese language with a recognizable divergence from the accent of the people in the east. But in the language spoken and in their mode of dress and daily life they do not differ from the Burmans of the plains. In the north of the district, if there has been admixture with Shan stock of the Upper Chindwin, no distinctive characteristic can now be eliminated. The Yaws, a hill tribe with a separate dialect, are mentioned in the census reports of 1891 and 1901, and their country is, properly speaking, the Yaw subdivision of the Pakôkku district. Locally, everything to the west of the Pagyi hills in the Yinmabin subdivision is spoken of as the Yaw country by the Burmans of the plains, while, west of the Pagyi hills, the villagers disclaim the title and apply it, and properly, to the inhabitants of the Yaw valley still further west. No one in the district admits that he is a Yaw, and there is no trace of a peculiar dialect or peculiar modes of life in the western glens.

Along the Yamas are found the descendants of captives taken from Zimmè (Chieng-mai) in Siam by Tha-lun-min-ta-ya-gyi * Intermarriage of these Shan captives with Burmans took place freely, and, although the remembrance of Shan ancestry was kept alive and still exists, all racial and domestic peculiarities have long disappeared, and the Shans are not to be distinguished from Burmans.

The population at the present day is, in fact, almost entirely Burmese. The principal races and castes at the census of 1901 were as follows:—Indigenous: Burmans, 274,193; Karens, 43. Non-indigenous: Pathans and Shaikhs, 635; Hindu castes, 296; Sikhs, 209; Zairbadis, 115; Chinese, 65. The total population was 276,383. The languages spoken were:— Census figures.

Burmese by	...	274,508	Gujarathi by	...	29
Karen	...	44	Punjabi	...	33
Chinese	...	68	Tamil	...	91
Hindustani	...	1,126	Telugu	...	24
Hindi	..	233	English	.	69
Bengali		97	Others	. .	61

By religion 274,249 were recorded as Buddhist, 67 as Animist, 911 as Hindu, 786 as Musalman, and 370 were of

* The date given by local tradition is B E. 999 [A.D 1637], which would correspond with Thado-dhamma-yaza, brother of Maha-dhamma-yaza, in whose reign Zimmè was annexed to Burma. Tha-lun-min-ta-ya-gyi, of the Burmese *sittans*, or official lists, appears in the Hsenwi Chronicle (*Upper Burma Gazetteer*, Part I, Volume I, page 246) as Sao Lông Mengtara. The date given in the *sittans* is no doubt approximately correct.

other religions. Of the numerically insignificant non-Burmese population, the Chindwin Battalion of the Military Police accounts for about half, and the remainder are made up of the small trading colony of Chinese in Mônywa, and European and Eurasian officials and their non-Burmese servants, also in Mônywa. Away from Mônywa the alien population could almost be counted on the fingers of one hand. The few found are often retired military policemen, who have settled down as cultivators and graziers. The population by census is shown in the following statement :—

Year.	Houses.	Total population.	Average per house.	Area of the district.	Density per square mile.	Persons wholly or partly dependent on agriculture.	Area under cultivation.
				Sq. miles.			Acres.
1891	41,794	233,316	5·58	3,490	67	130,086	179,121
1901	60,956	276,383	4·53	3,486	79	165,621	347,194

In the ten years the population increased by 43,067, or 18 per cent., and the houses by 19,162, or 45 per cent. The disproportionate increase under the latter head has no particular significance, as the house for census purposes is a term which allows of elasticity in local interpretation. At Regular Settlement, the population in 1906 was estimated to have numbered 300,041, an increase on the 1901 figure of 8·55 per cent. In other words, the rate of increase during the census decennium appears to have been maintained in the succeeding quinquennium. The programme of Public Relief Works for 1908-09 estimates the population of the district at 3,04,021, this estimated figure being exceeded by three Upper Burma districts only, namely, Pakôkku, 3,56,489, Shwebo, 322,676, and Myingyan, 360,877. All three districts have a much larger extent than the Lower Chindwin. The population in the year of Settlement, 1906-07, was estimated at 303,167.

Densities. The density in that year was—(*a*) to the occupied square mile, *i.e.*, to the mile of land claimed as in the possession of some one, whether cropped or not cropped, 251 ; (*b*) to the crop matured square mile, 445. The densities vary considerably in different parts. Taking into consideration both land in occupation and land not yet taken up, but culturable, that is to say, excluding hill sides and other unculturable waste places, it was estimated that the densities in the Settlement year varied from 1,008, 425, and 248 in some of the closely cultivated and densely peopled soil-tracts near

Mônywa: 363 in the southern half of the valley of the Chindwin: and 332 in the irrigated region along the North Yama stream; to 42, 48, 96, 99 and 103 in remote tracts on the north and west; some of the latter figures (since the averages do not take into account areas not cadastrally surveyed, nor the areas of reserved forest) would be still further reduced if the culturable waste south of Kani, at present not surveyed, were included. The population is therefore pressing on the land in some parts of the district.

The densities by Settlement soil-tract are shown in the following table, which assumes 4·84 souls to the *thathameda* household:—

Soil tract.	*Thathameda* assessed households.	Estimated population.	Total culturable land in acres and square miles.	Density per square mile.
I	776	3,755	9,683 = 15·1	248
II	2,585	12,511	7,956 = 12·4	1,008
III	6,042	29,243	43,986 = 68·7	425
IV	4,973	24,069	95,587 = 149·3	161
V	5,298	25,642	78,090 = 122·0	210
VI	5,258	25,448	155,184 = 242·4	104
VII	1,718	8,315	45,633 = 71·3	116
VIII	2,304	11,151	57,801 = 90·3	123
IX	3,664	17,733	62,590 = 97·7	181
X	3,655	17,690	31,223 = 48·7	363
XI	1,504	7,279	27,957 = 43·6	166
XII	4,371	21,155	71,929 = 112·3	188
XIII	2,625	12,705	24,449 = 38·2	332
XIV	5,558	26,900	106,675 = 166·6	161
XV	1,432	6,930	28,303 = 44·2	156
XVI	793	3,838	57,645 = 90·0	42
XVII	2,474	11,974	66,960 = 104·6	114
XVIII	262	1,268	16,954 = 26·4	48
XIX	3,010	14,568	51,419 = 80·3	181
XX	171	827	5,519 = 8·6	96
XXI	544	2,632	5,254 = 8·2	320
XXII	1,272	6,156	39,675 = 61·9	99
XXIII	2,349	11,369	70,526 = 110·1	103
Total ...	62,638	303,167	...	...

The district density figure, according to the census area of the whole district, about the accuracy of which there is some doubt, was 79, which is identical with the average for the whole of the dry zone of Upper Burma. By townships, and estimating on the total area of all conditions

of land, the Salingyi township, on the west bank of the Chindwin river in the south, is one of the most thickly populated townships of Upper Burma, whilst in the Kani township in the north-west the inhabitants are as scattered as in some of the wildest areas of the province.

The densities by township were, *vide Imperial Gazetteer* :—Budalin, 123 per square mile; Mônywa, 185; Kani, 27; Salingyi, 172; Palè, 68.

Preponderance of females.

The census of 1901 showed that the district had in March of that year a higher proportion of females than any other district in the Province. The figures were; males 121,967, females 154,416 The excess appeared at the preceding census also, which was taken on the 26th February 1891, and it may be ascribed to the annual emigration of adult males to Lower Burma and elsewhere, operating directly in reducing the population of males on the day of census, since the tide of return has not in March reached its highest point, and indirectly in raising the reproductive age and thereby increasing the number of females born.

Towns and large villages.

Mônywa and Alôn have been notified as Towns under the Upper Burma Land and Revenue Regulation and Mônywa is a Municipality. Their population, and the estimated population of other villages which contain 200 households or over, is shown in the following statement. The figure is for the Settlement year.—

Settlement sub-tract.	Towns and villages.	*Thathameda* assessed households in 1906-07.	Estimated population at 4·84 souls to the household.
II	Nyaungbyubin ..	369	1,7[illegible]7
	Thitsein ...	20[illegible]	1,011
	Kyehmon ..	406	1,[illegible]66
III	Monywa with Hlegu ..	...	7,869 (census figure).
	Alon with Kanyut	604	[illegible]
	Monywa	[illegible]	1,62[illegible]
	Lezin	[illegible]	1,[illegible]9[illegible]
IV	Kyaukka North	[illegible]	1,[illegible]95
	Kothan ...	2[illegible]	1,4[illegible]
	Thazi ...	6[illegible]2	[illegible],010
	Myonaw .	227	1,0[illegible]
V	Kyaukseitpon North	222	1,[illegible]74
	Nyaunggan ...	278	1,[illegible]21
	Budalin ...	4[illegible]9	2,386
VI	Ngwedwin .	26[illegible]	1,[illegible]9
	Waytaung ..	260	1,2[illegible]
	Minwa ...	246	1,[illegible]91
	Indaing ..	231	1,118
	Maletha ...	251	1,429
	Kanbyu ...	219	1,059

Settlement sub-tract.	Towns and villages.	*Thathameda* assessed households in 1906-07.	Estimated population at 4·84 souls to the household.
VI—concld.	Naunggyi-aung	332	1,606
	Ayadaw ...	452	2,187
	Myenet ..	205	992
VIII	Maungdaung ...	409	1,979
	Kinzan ...	212	1,026
	N[illegible]p[illegible]yin .	45[illegible]	2,178
	Y[illegible]t .	2[illegible]7	1,3[illegible]9
IX	Salingyi	26[illegible]	1,282
X	Kengon ..	2[illegible]	1,127
	Siton .	[illegible]31	1,6[illegible]2
XI	Linsegyet ...	209	1,[illegible]11
	Ngakon	231	1,118
XII	Kyadet ..	280	1,355
	Hlawga ..	245	1,186
	Nyaunggon ...	[illegible]25	1,089
XIII	Konywa	207	1,001
XIV	Chaungbyet ..	2[illegible]7	1,098
	Maukhwin ..	215	1,0[illegible]0
	Kyaun ...	266	1,287
	Letpagan ...	[illegible]20	1,064
	Palè ...	247	1,195
XVII	Yinbaungdaing	213	1,030

The district is one of large villages, and their number appears to be growing, for at the census of 1901 there were 20 villages only with 1,000 inhabitants—the equivalent of 206 assessed households—or over, whilst the number was 41 in the Settlement year.

Social and religious life: Buddhists.

The social life of the Burman in the Lower Chindwin district is that of his fellows in the dry zone, and the Buddhism of the district is the Buddhism of Upper Burma, with no outstanding distinctive feature. There is a list of Buddhist dioceses in the district Record Room, but it dates from 1895, and there have no doubt been changes since that year. There is, in the Buddhist hierarchy of the district, no central authority within its borders. The *gaings*, or dioceses, are small and numerous, and no *gainggyôk* (abbot) or *gaingôk* (prior) acknowledges the authority of any provincial superior, *sayadawgyi*, resident in the district. The *gainggyôk* and *gaingôk* state emphatically that there is no authority between them and the *thathanabaing*, or Grand Superior The Lèdi *sadaw*, or *sayadaw*, famous throughout the country though he is, has no administrative authority outside his own monastery precinct.

Among the monks, there are two sects, calling themselves *Shwegyin* and *Thudamma*, corresponding with the *Sulagandi* and *Mahagandi* sects of Lower Burma respectively. The split is an ancient one, and in Burmese times was more pronounced than it is now. The growing slackness of the Order in all sections is said to be tending to a *rapprochement*. The sects are distinguished by no separate ecclesiastical organization, and may in that respect be compared with the High and Low parties in the Church of England. The tie of discipline is, however, so loose, and the authority of the *gainggyôk* so shadowy, that the few Shwegyin monks in Mônywa will assert that they are not under the authority of the Mônywa *gainggyôk*, but claim to be under the nearest *gainggyôk* who happens to be at Shwegyin. The only one in the district is at Kyehmôn, south of Mônywa. The Mônywa *gainggyôk* is, however, emphatic that all the forty-nine monasteries in Mônywa, including the four Shwegyin monasteries, are within his control, and it is probable, at any rate theoretically, that the claim is correct, though in practice it is doubtful whether a recalcitrant monk would be punished. The Shwegyin sect practise austerity, whilst the Thudamma monks allow themselves great laxity in minor matters, such as smoking tobacco, witnessing theatrical exhibitions, and the like. In number the Shwegyin have always been fewer than the Thudamma,

and they have never supplied a *thathanabaing*. The two sects do not mingle at Buddhist ceremonies and there is much mutual hatred.

The *pôngyis*, or monks, of the district have a fair reputation for learning over the whole province, and one of them, the Lèdi *sadaw*, is the most famous and widely venerated expositor of Buddhist texts now living in Burma. They also enjoy a well-deserved fame for chastity and sanctity. Judged, however, by other than Burmese standards, the priesthood in the district is believed to have a low average of Pâli learning, and there are few monasteries which possess complete copies of the Buddhist scriptures. The monk has usually a scanty Pali vocabulary, and no syntax. All can repeat texts in the original with fluency, while generally ignorant of their meaning.

The religion is generally believed to have a slightly weaker grip on the mass of the people than in some other districts, such as Kyauksè, Sagaing or Mandalay. This is partly explained by the deeper and firmer substratum of animism, which permeates the religious life of all classes, including the priesthood, and has so deep an influence with large numbers as to make their Buddhism little more than a name. No doubt the British annexation is also in part responsible. The policy of Government has taken education largely out of the hands of the monks, and the cords of monastic discipline have become relaxed. Monks have in many places diminished their influence by accepting Government grants for their schools, amassing property of all kinds, witnessing theatrical performances, and even allowing plays to be performed within the precincts The practical interference in affairs, which was a right of the priesthood in Burmese times, has also disappeared and, with it, some of their hold on the people. All these influences are tending towards the relaxation of the old Buddhism.

It is stated that there exists among the people of the district a distinct Theistic tendency, inconsistent with Buddhism, which expresses itself among the more intelligent by reading into Buddhism the doctrine of a supreme intelligence, analagous to the Christian idea of an eternal God and in the more ignorant by an approach to idolatry, such as the worship of the image of the Zidaw *nat*, *vide infra*. The bulk of the people are so ignorant of the essentials of Buddhism that its hold upon them is, it is stated, little more than conventional. The Lèdi *sadaw* has moved the people at intervals to a temporary zeal and strict observance of precepts, but his influence is spasmodic, save upon

a few earnest people who have formed a sort of "Holy" club in Mônywa.

There are individuals among the laity who style themselves "Paramats." They are few in number, but are said to be generally men of intelligence and independence of character. Their views seem to bear a resemblance to those of the schismatics in the heresy of the Mans, *vide* Chapter II. They will not use images nor pay respect to the monks, but profess to follow Gautama Buddha's teaching in its abstract and pure excellence.

The English Wesleyan Mission. The English Wesleyan Mission has had some success in evangelization. The attitude of the Burmese community is stated to be generally carelessly tolerant. No material inducement is offered to a convert: on the contrary, the people have socially and materially much to lose by becoming Christians. Since the commencement of the Mission in 1892 there have been 139 adult baptisms and there are now 118 adult church members, the number of members for every fifth year having been—1893, 2; 1898, 16; 1903, 49; 1908, 118. This small community has built its own church and supports a Burmese pastor, besides subscribing liberally for mission work in the district. It represents every class and occupation, and is in regard to livelihood independent of the mission. The educational work of the mission is described in Chapter XII.

Roman Catholics. There is a Roman Catholic place of worship at Mônywa, the mission being administered as a branch of the Chaungu Mission in Sagaing district. The number of adherents is 200, for the most part officials, native Christians, and Karens of the Military Police with their families. Shortly after the annexation, a permanent mission was established and a church erected near the present Civil Hospital. On the priest in charge dying, no successor was appointed, and services have since been conducted by visiting priests. The first church was rebuilt on a new site near the Civil Police lines a few years ago, and a brick church is now in process of erection. The mission contains a few descendants of Portuguese and other captives, who were—according to local tradition—brought from Syriam near Rangoon, and settled in Payeikma near Amyin, in 1647. [The date given in the *British Burma Gazetteer*, Volume II, page 673, *sub. v.* Syriam, is 1613.] Their numbers were added to by captives taken at the second capture of Syriam by Alaungpaya in 1756. The Chaungu Mission had been established in the interval, in 1721, by Barnabite brothers acting under the auspices of Nerini.

Animism: The Alôn festival.

The legend of Batha-gywè has been noticed in Chapter II. The account goes on to say that Sawmunit was inflicting on the corpses the indignity of beating them with his cane when they suddenly became *nats*, or spirits. This so impressed him that he founded a palace at Nandaw (now Alôn) for their habitation, and appointed *nattein*, guardians of the cult, to look after the palace and preserve the worship by an annual celebration, which has remained in full vigour up to the present time. There are still *nattein* who are said to be descendants of the original guardians appointed by Sawmunit. There are also *natkadaw*, sibyls, women of the neighbourhood who for the time being profess to be possessed by the spirit. The word means spouse of the spirit. They combine the functions of intermediates between the spirit and humanity, able to offer up prayers as adepts, and of prophetesses. The *nattein* are presented with offerings in money and kind, and in return give to the donors cups of water of the Chindwin river, which is supposed to become, when so presented, a panacea and a charm against all dangers The sibyls will prophecy on receipt of payment; they perform frenzied dances round a fire during the nights on which the festival is in progress.

The celebration begins annually on the fourth of the waning moon of the month of Tabaung, about the beginning of April, when the *natkadaw* and *nattein* enter the Nandaw quarter in carts drawn by buffaloes. They do not on this occasion receive offerings or dance, but their entry is the signal for the commencement of the fair. On the 5th waning a similar procession takes place at Salun village, a few miles north of Alôn, and here offerings are received and dances take place for two days, when the scene shifts to Shabyedaung for two days. Finally, on the 9th waning, the *nattein* and *natkadaw* again enter Nandaw, when the most important part of the festival begins. Offerings amounting in value to as much as two thousand rupees are said to be received by the *nattein*; the *natkadaw* do not receive so much. The attendance at the fair increases, and buyers and sellers come from further afield than in the earlier part of the proceedings. At the end, the *nattein* and *natkadaw*, as atonement for their temporary aberration from the true religion, make an offering to the monks of part of their earnings. The right to be a guardian of the cult descends in the female line and is jealously guarded. As recently as five years ago, it was the subject of a suit in the Civil Court. There are different *nattein* for the different places—Nandaw, Salun, and Shabyedaung,—where the

festival is held. The status of *natkadaw* is not inherited, and anyone is liable, as the spirit seizes her, to 'confess the god.' The woman who dances round the fire in a frenzy this year may be a calm spectator next. There is a general opinion that some of those who appear as *natkadaw* are moved more by the hope of gain than by the spirit within them. The same *natkadaw* appear at Salun and Shabyedaung, and take in turn the exhausting duty of dancing.

The spirit into which Batha-gywè is said to have been translated is now called the Bodawgyi or Badôn *nat*.

The Zidaw festival. The Alôn festival is the most important celebration of the worship of *nats* or demigods, but there are others, and the one next in importance is held at Zidaw, west of Yinmabin, and, as at Alôn, the occasion serves as a fair, which is attended by traders from long distances. The legend, which as usual embodies a history of death against the course of nature, is connected with Anawrahta of Pagan, as is the Alôn legend. The festival is held at the beginning of April. The worship of an image of the *nat* Ma Ma Gyi, or Mè Min Gyi, forms part of the ceremony, and some of the *natkadaw* are said to be men dressed up in women's clothes.

Other spirit-festivals. There is a festival at Pyanhlè, a few miles north of Yinmabin, but it is of minor importance. Whether at Zidaw or at Pyanhlè, it is unlucky to talk of boats or of travelling on the Yama stream, since the *nats* lost their lives by drowning in it.

A spirit-festival is held at Ma-u, an offshoot of the Alôn festival, as Pyanhlè is of Zidaw. Ma-u village is about five miles south of Mônywa on the Myinmu road. Natgyi on the Chindwin also has a festival.

Distinct from what may be called the worship of personal *nats*, the spiritual descendants of human beings, is the worship of the spirits of nature*—the pixies, trolls, elves—which inhabit the house, the marsh, the jungle. This is universal, and the ritual presents no exceptional features.

Caste. There is no trace of caste in the true sense among the Burmans of the district. The labouring class—coolies—are in a minor degree looked down upon, but the man who is a cooly this year may be a cultivator next, and is under no permanent social ban. Outside one or two villages there

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* There is possibly an etymological connection between the word *nat* and *nature*; it may be noted that the natural course which a stream would follow if it were not diverted by irrigation is the *nat chaung*; so the wild form of a cultivated fruit is indicated in Burmese by prefixing the word *nat*.

is a separate location for the families of pagoda slaves, who are professional beggars, and act as grave-diggers also, and these families are in fact under a social stigma, and are isolated, and intermarriage with other families does not take place. But their origin, as is manifest from copies of the old *kyauksa*, or lithic inscriptions, in which the names of the original pagoda slaves sometimes appear, was not Burmese. The dedicated persons are in some inscriptions stated to be foreigners, and in others, although the fact of a foreign origin is not recorded in the inscription, the names are Indian names transliterated into Burmese. No doubt they were captives taken in war, and the separation is not one which arose among people of one race. Nor is it the expression of any attempt to crystallize a craft. There are several places where a craft has crystallized, and the craftsmen congregate in one place, *e.g.*, Wayaung and Kyehmôn, but there is no caste. There is a record of pagoda slaves at Thazi, Myogyi near Yinmabin, and Salingyi—*vide* Chapter II;—and some are to be found at Mônywa and no doubt at other places.

Standard of living. Average agricultural income.

The standard of living varies a good deal. The average income of the agriculturists examined in detail at the *thathameda* enquiries made at the Regular Settlement of 1906—1909 is exhibited in the following statement, by Settlement tracts :—

Soil tract.	Average income.	Soil tract.	Average income.	Soil tract.	Average income.	Soil tract.	Average income.
	Rs.		Rs.		Rs.		Rs.
I ...	210	VII .	139	XIII ...	116	XIX ...	82
II ...	49	VIII ...	121	XIV ...	92	XX ...	60
III ..	91	IX .	81	XV ...	77	XXI ...	58
IV ..	116	X .	75	XVI ...	67	XXII ...	86
V ...	107	XI ...	72	XVII ...	70	XXIII ...	63
VI ...	193	XII ..	113	XVIII ..	68		

The figures are the total of the gross income—not excluding cost of cultivation—on the agricultural side of account, and of the nett income,—*i.e.*, after cost of tools, etc., has been excluded—on the non-agricultural side. There is a special reason why the Tract II figure is low. Only one village was examined, and there happened to be a considerable number of absentees. The average income of an agriculturist is, as a matter of fact, high in this tract. The average income over the whole district was Rs. 95.

It will be seen that the average was the resultant of widely separated extremes. In the alluvial tract south of Mônywa (I) the average income was found to be Rs. 216, a figure which recalls the incomes ascertained in the rich delta districts of Lower Burma. In most of the developed tracts in the south-east, *e.g*, IV, V, VI, VII, the average income of the agriculturist exceeded Rs. 100; the arid, infertile plateau between Kyaukka and the Mu (VI) was not an exception, the precarious and restricted income from the land being largely supplemented by the sale of cattle. West of the river the generality of soil-tracts exhibited an average income lower than the district figure, but the irrigated region along the North Yama (XIII) and the black-soil tract which lies to the south (XII) exceeded it.

Before, however, it can be utilized as a criterion of the standard of living, there are certain qualifications which require to be applied to the figure of average cash income. In the first place, the store of food-grain raised from a cultivator's fields was estimated at the village price and counted as a cash receipt. It follows that in calculating the average income of a cultivator living in the neighbourhood of Mônywa, whose fields supplied him with food sufficient for the year, and of another cultivator in a remoter part, also provided with food from his own fields, the recorded figure of income of the cultivator living near Mônywa, in a tract of high prices, would largely exceed that of the other living in a remote village, with a small demand for field produce and prices correspondingly low, although the food-grain and the amount of it consumed—important items in the standard of living—might be identical. Moreover, in the remoter parts of the district, services rendered are often remunerated by services returned, as when a practised cultivator sows his less expert neighbour's field with sesamum—the sowing of sesamum calls for a skilled hand—and, later on, receives a day's weeding free; or as when—the commonest instance of all—the neighbours assemble and reap each other's crop in turn. There is no out-of-pocket expense and there is no entry in the income account, whereas, in a developed tract, there would be cash transactions, swelling the figure of income. This also tends to exaggerate the figure of income in the developed tracts, but the enhancement represents no real difference in the standard of living. On the whole, it may be said that there are more wants and that there is a higher standard of living in the accessible, developed tracts in the south-east, but that the standard of living in the more distant tracts is not so much

lower as the figures of average income—recorded in the manner explained—might in some cases suggest.

Food. The food-grain, it is said, has not changed since Burmese times. It was then and is now, rice alone in the rice-growing tracts and in the richer tracts which do not grow rice, such as some of the inundated lands south of Mônywa: millet alone or millet and rice mixed in the millet-growing tracts: and, in the tracts adjoining forests, rice mixed with jungle plants, yams of several sorts, and other wild products, the proportion of these varying directly with the adversity of the season and the deficiency of the rice crop. The food-grain which is best liked is rice. There is not much evidence that it is more generally eaten than in Burmese times. Of the millets, the variety consumed is almost exclusively the red millet. The usual statement of the people is that the grain of the white millet, *sanpyaung*, is rougher to the palate than that of red millet, *kunpyaung*: the opposite statement is made in most other districts and in the parts of the Lower Chindwin where white millet is extensively grown, south-east and north-east of Mônywa As a matter of fact, the taste for white millet is an acquired taste and, when acquired, the people like white better than red. The District Fund receipts from slaughter houses have steadily risen, and suggest that there is no lack of money with which to purchase meat, of which the Burman is fond.

Housing. His house is seldom the object of much expense to a Burman, and practically all the houses are unsubstantial structures of posts of junglewood and bamboo-matting, differing only in the material used for the roof. Occasionally, a wealthier villager may build himself a plank house, but it is the exception. There are no prolonged rains to call for stout roofs and walls, and the house, if flimsy, rises all the more easily and cheaply from its ashes when the village undergoes—perhaps in one hot weather out of five—its periodical burning. A plank house is therefore a sign of wealth, but a house made of matting is not a conclusive indication of poverty. As regards roofing material, three kinds are used. The most expensive, the most water-tight and fire-proof, is of bamboos, split lengthwise and spread out flat. No bamboos are grown in the district except in the west and north under the hills, and the variety grown there is said to be subject to the depredations of insects and is not used for roofing. All the bamboos used in roofing are therefore purchased, and a large supply is available annually at Alôn, where many of the rice and

timber-carrying rafts from the Upper Chindwin are broken up. Like the plank house, the presence of a bamboo roof is an indication of prosperity, though the absence of such a roof does not necessarily connote poverty. In the parts of the district near Mônywa, many of the houses are roofed with this material and, although no data are available for comparing the existing number of houses so roofed with the number in Burmese times, there is no reason to think that they are fewer, whilst the price of bamboos has risen greatly, and this indicates greater purchasing power. Next in order of expense comes the roof of thatching-grass, and this is found in the tracts along the river and near marshy places where thatching-grass grows. Least expensive of all is the roof of the leaf of the *tari* palm, and this is found in the palm-sugar tracts, the uplands between the Mu river and Kyaukka, and south of Salingyi. The villages generally, although as a rule they afford no suggestion of opulence, seldom present a squalid appearance, even in the poorest tracts.

Clothing.

In the less developed tracts the wife spins the cotton and weaves the clothing for the family. Nearer the Chindwin and in the richer inland tracts the clothing is purchased, or, more frequently, the material is purchased and made up in the house, or given to a Burmese tailor to make up. The material, if coarse, is often woven in the district of Manchester thread, or of that and native thread mixed. The chief weaving centres—all the weaving is done in the house: there are no factories—are in the cotton tract and underneath the Kyaukka hills to the west of it, and near Salingyi. Home-sewn garments are usually sewn by the husband, not by the wife. The people agree that the domestic loom is disappearing before the advent of cheap, made-up cottons In the inundated tracts south of Mônywa there is said to be no domestic spinning at all now, whereas in Burmese times every house spun and wove its own garments.

Expenditure on works of public utility.

Less money than formerly is now expended on works of public utility, bridges, wells, rest-houses, causeways. The figures reported to the authorities have been, taking the average annual expenditure in five-year periods,—

1894 to 1898	Rs. 27,720	per annum.
1899 to 1903	Rs. 28,865	
1904 to 1908	Rs. 7,334	

The consensus of opinion confirms the tendency shown in the figures, and the reason assigned is neither diminishing

prosperity nor a falling away from the Law, but the much greater expense of purchasing timber and bricks and engaging labour. To these reasons, which are valid, may be added the further one that in Burmese times it was unsafe to be rich, and the rich man, by devoting his savings to the erection of a work of merit, removed a possible source of danger to himself and simultaneously obtained the approbation of the world.

All the monasteries are substantial structures of timber.

Agricultural stock. Agricultural stock has largely increased, as may be gathered from the following figures:—

Year.	Total number of cattle.	Population (by census except for 1906-07).	Average per soul.
1890-91	99,589*	233,316	·42
1900-01	228,066*	276,383	·82
1906-07	258,257†	303,167‡	·85

* From the Revenue Administration Report.
† By Settlement count.
‡ By estimate, from the households assessed to *thathameda.*

The agricultural households enumerated in the *thathameda* rolls of 1906-07—*vide* Chapter VI—were 35,724, the families having agriculture as a subsidiary occupation were 3,661, and the betel-vine tenders numbered 229, in all 39,614; and it is the cultivating households which own the majority of the cattle. Estimating the households mainly or partly engaged in agriculture at 45,000, the average stock of cattle per household exceeds six head, a high figure. The enquiries at Settlement disclosed the fact that in the high-lying plateau between the Kyaukka and the Mu there was considerably more than one head of stock per head of the whole population, whether agriculturist or non-agriculturist, and including workers, non-workers, and the indigent. The district has therefore a source of considerable wealth in its cattle.

Agricultural indebtedness. Enquiries were made at Regular Settlement in 190 out of the 322 village-tracts, all but two of the Settlement soil-tracts being represented. The enquiries related to the extent of indebtedness at the close of 1907-08, a calamitous agricultural year, and embodied the statements of the

headmen and elders. The usual method of obtaining loans was stated to be as follows :—

	Villages.
On-demand promissory notes : in	151
Bond	14
On-demand promissory notes, with property pledged as well	8
Document or *parabaik* (a sheet of black paper, written on with a pencil) unstamped ...	5
Verbal promise	4
Bond with mortgage of property	4
[No loans	4]

The agriculturist can therefore almost always procure a loan on note of hand, and his credit is good. The rates of interest on small loans below Rs. 50, embodied in an on-demand promissory note with a single signature, were stated to be—

Highest rate—in 36		out of 45 villages	60 per cent. per annum or *takulat*, the principal and half as much again as interest, after the expiration of ten months.
Do.	in 6		48 do.
Do.	in 3		Less than 48 do.
Usual rate—in 30		out of 45 villages	60 do.
Do.	in 6		48 do.
Do.	in 8		36 do.
Do.	in 1		Less than 36 do.

Rates are therefore high for small loans, but there is no rate higher than 60 per cent. per annum. The rates of interest for larger loans, on note of hand as above, were stated to be—

Highest rate—in 1		out of 42 villages	60 per cent. per annum.
Do.	in 7		48 do.
Do.	in 2		45 do.
Do.	in 1		42 do.
Do.	in 24		36 do.
Do.	in 5		30 do.
Do.	in 2		24 do.
Usual rate—in 6		out of 42 villages	48 per cent. per annum.
Do.	in 2		45 do.
Do.	in 26		36 do.
Do.	in 6		30 do.
Do.	in 2		24 do.

Thus the usual rate for large loans is 36 per cent, per annum, *i.e.*, it drops to almost half the amount asked for

small loans. The rate is not extravagantly high, when the nature of the security is taken into account and the prevailing rates of interest in an eastern country.

In 141 villages the record was not separated for large and small loans, and these villages gave the following information for undifferentiated loans of the kind explained above:—

Highest rate—in 98	out of 141 villages	60 per cent. per annum.
Do. in 24		48	do.
Do. in 12		36	do.
Do. in 5		30	do.
Do. in 1		24	do.
Do. 1		18	do.

Lowest rate—in 17	out of 141 villages	60 per cent. per annum.
Do. in 8		48	do.
Do. in 1		45	do.
Do. in 16		36	do.
Do. in 82		30	do.
Do. in 1		25	do.
Do. in 13		24	do.
Do in 1		20	do
Do. in 1		18	do.
Do in 1		12	do.

The figures suggest that—as in the 'separating' villages—60 per cent. is the usual rate for a small and 30 to 36 for a large loan, and that on large loans the rate occasionally falls a good deal below the latter figure.

The average indebtedness of a cultivator—exclusive of loans made by Government—was said to be—

Soil tract.	Rs.	Soil tract.	Rs.	Soil tract.	Rs.	Soil tract.	Rs.
I	28	VII	41	XIII	50	XIX	23
II	34	VIII	45	XIV	32	XX	20
III	33	IX	35	XV	29	XXI	...
IV	47	X	38	XVI	30	XXII	20
V	61	XI	28	XVII	30	XXIII	71
VI	64	XII	52	XVIII	...		

The average indebtedness—cultivators not in debt as well as those indebted being included—was, by local statement, forty-two rupees. It has to be remembered that practically all mortgages are usufructuary, and, if a cultivator has mortgaged his land, the mortgage-money does not appear

in the debt figure. Much of the land is in the hands of mortgagees, who are seldom non-agriculturists. On the other hand, the year preceding the record was very bad for the crops and certainly increased the debt figure in many tracts. Bearing this in mind, the burden of agricultural indebtedness cannot be considered great.

All the 190 villages, except one, recorded as the cause of indebtedness maintenance or cultivating expenses, or both; the exception borrowed in order to pay the land revenue. No village admitted indebtedness due to expenses incurred on edifices or ceremonial, and this is borne out by the figures of expenditure on works of public utility. The credit of the cultivator being good and his indebtedness low, it follows that he must be described as unextravagant. If not thrifty in the sense of saving much, he is certainly not spendthrift.

Sixty-two villages were asked whether the rate of interest had fallen since Burmese times; twenty-eight replied that they had, and the remainder that they were the same. The people generally have a wider knowledge than these figures would indicate of what is certainly a fact, namely, that interest rates have fallen everywhere, and largely. It was a rare occurrence in Burmese times to secure a loan at less than the *takulat* rate, 60 per cent. per annum, but this rate is now high for a loan of any magnitude.

Agricultural loans are for ten months, but the creditor is not precise to the date. Emigrants' loans are often for five months, from the date of departure for the reaping to the date of return. Chetties—the money-lending caste of Madras—are not found except in Mônywa, where there are one or two. The usual money-lender is a rent-receiving Burmese landlord, and he is to be found in Mônywa, Kani, Padu, Kanè, Kônywa, Budalin and many other of the larger villages.

The local terms for the usual rates of interest are—*Nga-mu-do,* interest of five *mu,* or *takulat,* the other half, 50 per cent. for ten months or 60 per cent. per annum.

Le-mu-do, interest of four *mu*	...	48 per annum.
Thôn-mu-do, interest of three *mu*	...	36 ,,
Mat-do, interest of one-fourth of a rupee		30 ,,
Hna-mu-do, interest of two *mu*	..	24 ,,
Hta-mu-hta-bè-do, interest of one *mu* and one anna ...	...	18 ,,

There is a custom along the Mu, and possibly elsewhere, where herds are numerous, by which the debtor herds his creditor's cattle and pays no interest on the loan. He may not use the cattle for ploughing. The *sabape* custom—both principal and interest repaid in kind—is unknown, and the *sabanyun* custom—the principal repaid in money, the interest in kind—occurs but rarely.

The relation of agricultural debt to income was also examined in detail at Settlement, and, although the average debt was found to be—generally—higher in the south-eastern part of the district, where the average income was higher, there were found to be several tracts with a high average income where the average debt was small, and in practically all parts of the district it was found that as the income increased the amount of debt fell. The figures were as follows, 3,109 agricultural households being examined. The income was that recorded in detail at the *thathameda* enquiries and is gross on the agricultural side, *i.e.*, cost of cultivation has not been excluded. It is nett on the non-agricultural side :—

Soil tract.	AVERAGE DEBT, IN RUPEES, INCURRED BY EXAMINEES, INCLUDING THOSE INDEBTED AND THOSE FREE FROM DEBT, WITH INCOME FROM				
	Nil to Rs. 50	Rs. 51 to Rs. 75.	Rs. 76 to Rs. 100.	Rs. 101 to Rs. 150.	Upwards of Rs. 150.
I	108	125	100	75	47
II	76	57	38	*Nil*	*Nil*
III	17	32	4	51	35
IV	31	35	23	23	9
V	44	51	34	51	26
VI	61	42	31	34	17
VII	80	56	56	53	42
VIII	28	35	32	29	23
IX	14	11	1	1	4
X	16	8	7	9	4
XI	19	12	7	13	10
XII	12	14	3	4	*Nil*
XIII	4	3	3	6	1
XIV	6	7	2	1	*Nil*
XV	2	3	1	*Nil*	*Nil*
XVI	5	4	14	6	*Nil*
XVII	29	23	7	1	28
XVIII	24	17	28	14	9

Soil tract.	Average debt, in Rupees, incurred by examinees, including those indebted and those free from debt, with income from				
	Nil to Rs. 50.	Rs. 51 to Rs. 75.	Rs. 76 to Rs. 100.	Rs. 101 to Rs. 150.	Upwards of Rs. 150.
XIX	18	93	8	4	2
XX	13	27	12	14	*Nil*
XXI	4	6	*Nil*	*Nil*	*Nil*
XXII	4	5	2	1	*Nil*
XXIII	13	9	8	6	3
Whole district ..	21	15	12	18	17
Percentage of indebted to total number in each grade over the district.	56	46	34	41	34
Total number of indebted families.	1,301	...	...	...	...

It will be noticed that more than half of the families incurred no debt at all; that there is in most tracts a fairly regular diminution in debt as the income rises—it is in five only out of twenty-three tracts that the three higher grades of income contain the highest average debt for the tract, in eighteen the highest average debt is reached by the two lower grades of income: and that the numerical percentage of debtors falls, in a reasonably steady series, when the income rises.

The average indebtedness of individual cultivators examined in detail at the *thathameda* enquiries was, over all examinees, whether indebted or not:—

Soil tract.	Rs.	Soil tract.	Rs.	Soil tract.	Rs.	Soil tract.	Rs.
I	60	VII	48	XIII	2	XIX	9
II	62	VIII	28	XIV	3	XX	17
III	29	IX	7	XV	1	XXI	4
IV	29	X	8	XVI	6	XXII	2
V	40	XI	12	XVII	17	XXIII	9
VI	30	XII	4	XVIII	20		

Although some agriculturally good tracts, *e.g.*, I, II and V, exhibit comparatively high figures of debt, other good tracts, *e.g.*, XII, XIII and XIV, reported practically no debt at all. *Reading this with the preceding paragraphs, the statement that the debt of a Burman rises with his credit appears not to be, in all cases, true of this district.* The average indebtedness, in the one year, of all examinees was Rs. 16. This harmonizes with the figure of average debt up to date, including a very bad year, given by the village elders, namely, Rs. 42'50. Comparing the last debt table with the last but two above, it will be noticed that, although there is no marked correspondence in the tracts with the highest or lowest amount of debt, the tables agree in reflecting a small extent of agricultural indebtedness on the whole, and in supporting the proposition that debt does not necessarily vary directly with credit.

In some of the poorer red-soil tracts, the practice of mortgaging the standing crop, or of selling it when standing, is common, and may be in part attributed to the fact that the bulk of the taxation is at present collected during the first three months of the year—at a time when all the crops have not yet been garnered. The prices obtained for a crop so sold vary with the interval between the loan and harvest, but are always low.

Land values. The bulk of the occupied land is held on a full private tenure, with no restrictions on transfer, *vide* Chapter X. Most of the land is owned by peasant proprietors, and is divided into a large number of small estates. The value of land in transfer is therefore germane to a consideration of the prosperity, or otherwise, of the mass of the people. In the paragraphs which follow, statistics have been shown for non-State land only, since the private tenure of land predominates.

Sales. Sales are rare. The area of land which was reported as having been obtained by purchase up to the date of the Settlement year 1906-07—from whatever year the sale dated—was 5,014 acres, made up of sales of wet (rice) land, 900; dry-crop land, 2,696; and mixed wet and dry land, 1,418 acres. The average purchase-money per acre over the whole district was Rs. 50; of wet land Rs. 85, of dry land Rs. 45, and of mixed land Rs. 39. The corresponding figures for mortgages, *vide infra*, are: over all, Rs. 37—wet Rs. 62, dry Rs. 29, mixed Rs. 31. The sale-value is therefore about half as much again as the value in possession mortgage. Correlating sale-values with existing (Summary Settlement) acre-rates in the manner described below for

mortgages, the average sale-value over all was found to be 86 times the land assessment. This figure indicates that land rates are low.

The wet-soil sale-values ranged from Rs. 300 per acre in the inundated rice-tract south of Mônywa to Rs. 21 in the remote Kuhnit-ywa glen in the south-west of the district. Comparing the values in the last quinquennial period with the average over all periods, it appeared that sale-values have tended to fall slightly, which should no doubt be attributed to the imposition of acre-rates on non-State land at the Summary Settlement. The dry-soil values ranged from Rs. 88 in the silt-bearing inundated tract south of Mônywa, and Rs. 102 in the similar tract on the opposite bank of the Chindwin, to Rs. 13 in the poor red soils of the Chindwin-Mu plateau.

The area reported as having been acquired by mortgage and still in the hands of mortgagees, whether simple or usufructuary, in the year 1906-07—from whatever year the mortgage dated—was 115,258 acres, or 14 per cent. of the whole occupied area of the district, made up as follows:— Mortgages.

	Acres.
Wet land mortgages	25,559
Dry land mortgages	70,613
Mixed wet and dry land mortgages ...	19,086

Mortgages are almost invariably usufructuary. The average mortgage money of wet land was Rs. 62 per acre; of dry land Rs. 29; and of mixed wet and dry land Rs. 31. This statistic affords some indication of the relative value of wet and dry lands. Wet land is about twice as valuable as dry. The average mortgage money, over all, was Rs. 37 per acre. The area occupied—cropped, with failed and fallow—in 1906-07 was 772,710 acres, and the land-revenue collection Rs. 3,01,005; adding to this 50 per cent. on account of land-revenue taken in the shape of *thathameda*, the land-revenue collections in that year may be estimated at Rs. 4,51,507, or ·58 of one rupee per occupied acre. The average mortgage value per acre was therefore some 63 times the average assessment, a high figure.

The wet soil mortgage values ranged from Rs. 117 per acre in the inundated tract south of Mônywa, and Rs. 223 in the irrigated region along the North Yama, to Rs. 23 in the poor red soils in the north-east of the district. The latest quinquennium—as with sales—showed a diminution in mortgage values. The values in dry-crop

land ranged from Rs. 83 and Rs. 129 in tracts with silt south of Mônywa, to Rs. 12 in the Chindwin-Mu plateau, and Rs. 4 in the poor soil in the north-east of the district. The general opinion of the people is that the same area can be mortgaged for more money now than in Burmese times, in spite of the belief that the produce of the soil is less than it was and the grain return to an usufructuary mortgagee smaller. The explanation which the people themselves give is that there is more money in circulation now and that the population has increased, and there may be added the further reason that, although the grain return may be smaller, the price obtained for it is greater. It is also stated that the value of dry land has increased because, on account of the uncertainty of the rice crop through decreasing rainfall, a larger area of dry land has to be cultivated now than before annexation, and there is more competition for such land. In the irrigated tract west of Kani it was stated that the return to a non-cultivating landlord from rice land taken on usufructuary mortgage was about 12 per cent.; this is a fairly high rate of interest on money lent on the security of land. The sentimental element in the value of land is considerable, and a comparison of the landlord's nett receipts with the mortgage values indicated that the return is usually less than 12 per cent.

Alienations to non-agriculturists.

Of the land reported as having been acquired by sale, the area found in the hands of non-agriculturists in 1906-07 was 1,171 acres: 'rent receivers' held 700 and merchants 171 acres of this. The area sold to *chetties* was ·92 of one acre. Of the land reported as having been acquired by mortgage, the area in the hands of non-agriculturists was 20,790 acres. Rent receivers held 10,698, merchants 4,899, and coolies 1,540 acres of this Many of the rent receivers were in their youth cultivators. No land was found in the possession by mortgage of *chetties*. The tracts in which mortgages to non-agriculturists are extensive are those in the vicinity of Mônywa: the riverine tracts, the black-soil tract west of the Chindwin, and the irrigated tract along the North Yama. The coolie mortgagees are for the most part from the south-east of the district, where emigration is most common and brings in a good deal of money. The figure in the Yewa valley was high in relation to the cultivated area in that tract, and the alienees, the Kani money-lenders, are said to be unsympathetic. The ratio of land mortgaged to non-agriculturists to the whole area acquired by mortgage was 18

per cent. The figures do not at present indicate dangerous concentration of land in alien or unsympathetic hands.

The households exempted from the household tax on account of indigence in the year 1906-07 numbered 3,746, and of these about three-fourths were recorded in the villages in the south-east of the district, where the arts and crafts preponderate. This is due to the fact that the artizan, when his strength fails, has often saved too little to support his declining years; he owns no land from which to obtain a small rental, and becomes a charge on the charity of the village. The unanimous opinion is that the cultivator is better off than the artizan and unskilled labourer. This is supported by statistics; on the west of the Chindwin the percentage of indigent to the total number of households was found to be, in 1906-07, 4·6, and cultivation largely preponderates on that side: whilst on the east of the river, where are found the arts and crafts, the percentage was found to be 7 2. Indigence.

The monthly rate of wages at headquarters is stated in the B Volume of the District Gazetteer to be Rs. 7 for an agricultural labourer, Rs. 10 for a cooly, Rs. 22 for a carpenter, and Rs. 30 for a blacksmith. The wage for an agricultural labourer presumably is for an adult male and does not include food: it averages annas 3·7 per diem and—with an allowance for food—would be about equal to the wage in agricultural tracts ascertained at Settlement, namely, with food, about five annas per diem. The rates of hire for skilled labour are rising. Wages.

The prosperity of the district has much increased since annexation, *vide* the remarks in Chapter X on its assessable capacity, and there appears to be no doubt that the power of the people to resist adversity is greater than it was in Burmese times. Such a year as 1907-08 would, the people confidently assert, have led to the entire desertion of numbers of villages in Burmese times, but there was actually not one which was deserted nor were there any signs of emaciation. Growth in prosperity.

The customs on various points of agrarian and village interest were recorded in selected villages at the Revenue Settlement of 1906-09. Agrarian customs.

(a) *Inheritance of land.*—The custom of division of land among the heirs in unequal fixed shares, according to the *dhammathat*, or code of traditional law, has fallen into disuse, and in most places it would seem that there is no recollection that it had ever been practised. The general custom is to divide the inheritance equally among all the children, without regard to sex. Prior to annexation, the eldest son was in some places given a slightly larger share

than the other children, possibly on account of his liability to render official services, and the privilege of a larger share was also, to a less extent, enjoyed by the eldest daughter. Division according to the *dhammathat* is, however, practised occasionally. If any of the heirs objects to equal division and the case comes into court, the shares are arranged according to the *dhammathat*; the heirs, in case of such an objection, sometimes divide forthwith according to the *dhammathat*, without going to court.

(b) *Sale of land.*—The right of sale existed, but was rarely exercised, in Burmese times. A right of pre-emption by relations existed. The persons who were coheirs, with the owner of the land, in the inheritance of which the land which was the subject of the sale formed a part, had a right of pre-emption before other persons, whether related or not. In certain places, owners of adjoining lands had a right of preemption which, however, could only be exercised subsequently to that of relations, and was probably seldom actually exercised at all. The right of pre-emption by relations occasionally prevailed, even where the pre-emptor was unable to offer quite as good a price as an outsider, but, if the difference of price was large, the land could always be sold to the outsider.

(c) *Mortgage of land.*—The right of redemption of mortgaged land endured in Burmese times for an indefinite period, and there was apparently no period of limitation. The custom of allowing the mortgagee three years' possession before redemption was general, but in most places certainly and in all places probably, the custom was not recognised unless embodied in the mortgage contract. When this condition was not included in the contract, the mortgagor could redeem at any time when a crop was not on the ground, provided generally that the mortgagee had been in possession for one season. If redemption occurred before the mortgagee had had any return for his capital, the mortgagor was required to pay, in addition to the principal, a sum varying from five to ten per cent of it as compensation.

(d) *The occupation of land held in undivided inheritance.*—Land obtained by inheritance and held in joint ownership may be worked before division either by each heir in turn or by one heir as tenant of all the heirs. These two arrangements seem to be about equally prevalent, and in most villages both arrangements exist. When the heirs work in rotation, the period during which the inheritance land is in possession of each is one year, and the heir in possession pays no rent to the joint account. When one of the heirs

works as a tenant, the rental goes into the joint account, that is, the landlord's share of the produce is divided equally among all the heirs, including the working heir. Rarely, the undivided inheritance is given to the poorest of the heirs to work free of rent. In one or two places the custom exists of heirs working roughly ascertained shares of inheritance land, prior to formal division. After division, a small portion of the property is sometimes left undivided, so that family relationships may not fade from sight. This portion is worked by the heirs in turn.

(e) *Division of inheritance.*—There is no fixed custom throughout the district regarding division of inheritance, and the matter seems to depend for the most part on the wishes of the heirs. Division does not usually take place until both parents have died; though it may take place if the surviving parent consents, or marries again. After the death of both parents, the inheritance is in some cases immediately divided; sometimes it is kept joint for a few years: and sometimes for several generations. Early division is the usual practice when the heirs are living separately at the death of the parents, or when they are not in agreement among themselves, or when the inheritance is large, or when the heirs have no other land in single ownership. Division is postponed if any of the heirs are minors, or if the heirs agree to work jointly, or if they have sufficient other land, or if the land to be divided is small. When division is amicable, there is usually no document of partition. If the division is not amicable, the land is sometimes divided by the elders of the village and lots cast; sometimes it is divided equally and a document of partition drawn up; sometimes it is divided by the elders according to the code of customary law. Sometimes it appears to be the case that documents of partition are drawn up, whether the partition is amicable or not. An exception to the custom that property is not divided until the death of both parents has been reported from one village, where property is divided immediately on the death of the father.

(f) *Field embankments and party-hedges.*—The property in the embankment between adjoining holdings of rice-land is determined by the flow of the water. If B's field receives water which has first passed through A's field, then A owns the embankment between the two fields. He has the duty of keeping it in repair and the privilege of opening or closing it to the flow of water at his pleasure. If—as is rarely the case—there is no flow of water from A's field to B's, or *vice versâ*, then the embankment is joint

property, and each repairs it when he thinks necessary. In the infrequent case of the existence of embankments separating holdings in dry-crop land, the same rule is followed; and fences on land of this nature are repaired by the cultivator who desires that the repairs shall be carried out. For example, the fence between A's holding and B's is repaired by the person who has his crop first in the ground.

(g) *Cultivation of waste land.*—The general rule is that before waste land is occupied, the headman of the village must be informed, but this rule is open to many exceptions. In some places the land is cleared, and the headman informed afterwards. Except in a few villages, waste land adjoining an existing holding is assigned by the headman to the owner of the adjoining holding, in preference to another. The person who first informs the headman of his desire to cultivate is, however, given the land in some cases, whilst in a few villages a portion of such waste is given to the adjoining cultivator and a portion to the applicant. When the waste does not adjoin an existing holding, the person who first informs the headman of his intention to cultivate is usually given the preference, though at some places the waste is given, if two persons apply, to the applicant who has the least land. When cultivators from other village-tracts come and settle in the village, they are allotted waste in the same manner as other villagers, if they apply. The right of a resident of another village-tract to enter on and clear waste, while remaining resident in the other village, is not always recognised.

(h) *Cultivation of alluvial land:* myenu, *recent alluvial land; and* myeyin, *old alluvial land.*—The customs regarding the division of *myenu* differ widely over the district. In several places, on streams so far apart as the Mu, the Chindwin, the South Yama, North Yama and Tinzôn, it is not divided at all, but the custom of *ngôklaik* prevails, by which the owner of permanent land on the mainland pushes forward his boundaries into the bed of the stream to embrace the new alluvial formation. In other places *myenu* is divided once for all by the headman and elders, and in these places, if land reappears on the site of land which has once been carried away, it is owned by the original occupier. In other places, annual division by the headman and elders is the rule, and land which reappears on the site of land which has once been carried away is also divided, but one village reports that, even where such a custom of annual division exists, the original owner has a valid claim to the new land. In nearly

all cases of division, *myenu* is allotted equally to the applicants in strips running at right angles to the direction of the stream. One or two exceptions to the rule of equal division are reported. In one village the width of the strips is fixed with reference to the working capacity of the applicant; in another, enough land is given to turn a plough in, when the area of available *myenu* is small. When division is made, the elders always assist the headman, and only the residents in the village-tract are eligible as allottees. Division between two village jurisdictions on the same bank of new alluvial land lying along the bank, is made by producing the common boundary of the village-tracts at right angles to the bank of the stream. One exception was reported, where this procedure resulted in disputes, and the revenue surveyor now makes an annual division. *Myeyin*, old alluvial land, is not divided at all, but remains in possession of the same occupant from year to year.

(i) *The deep-stream rule in regard to the possession of islands.*—An island in a stream belongs to the village-tract which is separated from it by the shallow, not the deep, arm, *i.e.*, the deep stream is the inter-village boundary. There are, however, exceptions; in one village the original cultivators continue to occupy the land although the deep stream may have shifted; in another the survey-block boundary is followed, and this is the usual rule in cases where the jurisdictions involved are the Lower Chindwin and some other district. In one village on the Chindwin south of Mônywa, where there is a dispute, the custom prior to annexation it is said did not recognize the deep-stream rule.

(j) *Right of way to an interior holding during cultivation and after.*—In most places the cultivator of an interior holding has a right of way to his land during the planting season. In one or two, it is stated that the permission of the exterior landholder must be obtained. The interior landholder must, however, in nearly all cases walk along the field embankment or close to the fence; and if the path along the embankment or fence is narrow, he must lead his cattle and carry his harrow. In some places he must leave his harrow once for all on his holding; in others, this is optional. Thus the custom ensures the growing crop against damage. In one village it was stated that any damage done to crops must be made good, the village being one where the interior cultivator is permitted to cut across crops in the early stages of growth. After a crop has been reaped there is a universal right of way over the field.

(k) *Right to jungle products.*—Anyone has a right to

collect all sorts of jungle products on unoccupied land, except that reserved by Government. In one place it is, however, recorded that part of the jungle is reserved by mutual consent for fuel for palm-sugar workers. On private land, the rights to grass, firewood, etc., are not clearly defined. In some places it is said that anyone has a right to these minor products and can take them at any time. In others the right can only be exercised during the non-cultivating season; in others, again, the right of the holder to prevent the common use of any product of his land at any time is recognised. If he wants to prevent the cutting of grass he has, however, to surround his land with a fence. The right to valuable products, such as fruit-trees and large jungle trees, always vests in the owner of the trees. The general conclusion to be drawn from the record is that the owner of non-State land has a recognised right to all the products of his land, but permits the free use of those which are of minor value.

(l) *Fruit trees planted by mortgagees, tenants, or co-heirs*.—There is little uniformity of custom in the treatment of fruit trees planted by a tenant during his term of tenancy, or by a mortgagee while the land is in his possession. In some cases the tenant or mortgagee owns the trees until the expiration of his tenancy or until redemption; in some cases the trees descend to his heirs. Sometimes the tenant or mortgagee pays a share of the produce of the trees to the landlord or mortgagor from the outset. On the determination of the tenancy, or on redemption, the landlord or mortgagor sometimes pays no compensation for trees planted: sometimes the cost of planting; sometimes half, and sometimes the full value of the trees. The landlord or mortgagor generally endeavours to terminate the interest of the tenant or mortgagee in the trees when the land returns to his possession. The consent of the landlord or mortgagor is usually necessary before trees are planted and, if it is not obtained, tenants or mortgagees are treated less liberally than if it is. The planting of long-aged fruit trees is regarded as indicative of—or likely to lead to a claim to—ownership of the land. There is also no generalisation to be made regarding the property in fruit trees planted on inherited land by one of several heirs. Sometimes the consent of the coheirs is required and sometimes not. The tree is sometimes the property of the planter and sometimes joint property: occasionally it is the property of the planter for his life and then becomes joint. Sometimes the planter pays a share of the produce to the coheirs and sometimes not. In almost every place the right of the owner of a tree

to visit it at any time, irrespective of the ownership of the land on which the tree is growing, is recognised. Occasionally the permission of the owner of the land is required when there are crops on the ground. With regard to fruit trees, nearly every village-tract seems to have a separate custom, and this is due to the fact that valuable fruit trees are rare, and customs have not crystallized.

(m) *Right of grazing cattle on field embankments.*—During the open season cattle from anywhere, even from another village-tract, may graze on the embankment of any one's field or on the field itself. There are few places in which the right of grazing cattle on a field embankment, during the cultivating season, is recognised as vesting in strangers as well as in the owner. If the right is recognized, the cattle must be led by a rope, and leading is sometimes required even in the case of an owner grazing his own cattle on his own field embankments. In one place it was stated that, though no one but the owner of the land might graze his cattle on the embankment, any one could enter and cut grass. At this place also the owner of an interior holding could not graze his cattle on his own embankment, as the exterior owner did not permit passage through the crops after planting.

(n) *Repair of old rest-houses, monasteries and pagodas.*—The custom generally is for old edifices to be repaired by the original benefactor or his descendants. If these remain in the village, their consent must apparently be obtained before repairs can be carried out by others. There are few places where the headman has by custom the authority to direct villagers to repair rest-houses and monasteries.

(o) *Repair of drinking-wells for men and cattle.*—It is recognised in the majority of places, but not in all, that the headman has power to call out the villagers to repair wells. Nevertheless, few wells have been constructed by the joint effort of villagers, as there are generally individuals anxious to acquire the merit of digging a well.

(p) *Construction and repair of tanks.*—In regard to the construction and repair of tanks for men and cattle, no definite custom prevails. Some tanks are constructed by private benefaction, others by persons interested, others by the village jointly. There was no definite custom in Burmese times either. Sometimes a tank made by a private person is repaired by joint effort.

(q) *Communal land.*—There is no cultivated communal land in the district. Cemeteries are regarded as communal, and so are, in many cases, the sites of rest-houses, monasteries,

pagodas, tanks and villages.

(r) *House-sites.*—The general rule is that sites are allotted by the headman on waste land within the village fence or, with the permission of the occupiers, taken from the curtilage of existing houses. The right of evicting existing residents does not seem to exist. House-sites are bought and sold, but not in many villages. In one such village it was reported that the headman, though he might not appropriate a small house site for a new-comer, could appropriate a portion of a large house-enclosure. Rentals are taken by ancestral owners of the house-site in some villages.

(s) *Main roads and much-frequented paths.*—Main roads between villages must not be closed for cultivation. A road, varying in breadth from that required for the passage of one cart to that required in order to allow two carts to pass, must be left. Much-frequented paths across fields must not be closed at all, in most places. In others, such a path may be closed temporarily, when there are crops on the land.

Tenants. All tenancies depend on contract, and there is at present no legislation, nor any custom having the force of law, conferring fixity of tenure. The landlord has the right, throughout the district, to eject tenants at the end of any cultivating season, whatever the previous duration of the tenancy. Mortgagors who work as tenants of their mortgagees have no special right of occupancy, and the mortgagee can eject at pleasure.

The area rented. The area of land held by tenants was found at the Settlement of 1906-07 to be 231,218 acres, or 29 per cent. of the whole occupied area of the district. Fifteen per cent. of all the State and 32 per cent. of all the non-State occupied land was rented. In the more developed parts of the district, in proximity to the railway and the river or to large villages, the percentage of rented to occupied land was found to be high. In exception to the general rule that the high percentages appear in the developed, populous tracts, a high figure—more than 50 per cent.—was found in the remote, land-locked Sè-ywa valley, but it was judged that, so far as the economic relations of landlord and tenant are concerned, the high figure was of less importance, inasmuch as the landlords in that region were content with low rentals.

The rent fractions. Of the rented area, all pays rent in produce except (*a*) about two per cent., which pays cash-rents; and (*b*) about four per cent., which pays no rent to the landlord but only the land-revenue. Of the produce-rented area, very little pays a fixed rental. Nearly all pays a fraction of the crop,

and the fractions vary from one-half to one-tenth.

In nearly every case, the payment of land-revenue is shared between landlord and tenant. More than one-half of the rented rice land pays one-half of the gross harvest, but in such half-gross rentals the landlord, on the *métayer* principle, usually contributes some of the expenses of cultivation, the most usual contribution being the whole of the seed. In lower fractions than one-half, the landlord often contributes nothing at all, but occasionally contributes half the cost of planting or reaping. About one-third of the rented dry land pays two-fifths gross or more than two-fifths; about one-third pays one-third gross; and the remainder pays either low fractions or a fixed rent or no rent.

Fixed rents. The area let at a dead, or fixed, rent was 13,549 acres in all, or about five per cent. only of the tenanted area shown above. Of this, the cash-rented area was 4,858 acres, or two per cent. of the whole area, and the remainder paid a fixed rent in produce.

The wet-land produce figures, which are everywhere small, are highest in the inundated tract south of Mônywa, and reflect the certainty of the crop in this region, which can count on a good crop of red bean, if the rice fails. The dry-land produce figure is high in the same region, where the crop of beans is secure and good; and in the western black-soil tract, which enjoys a certain crop. In the cotton tract the trouble of paying, on the occasion of each picking, a fraction of a long-harvested crop, cotton, and possibly in some cases the poverty of the soil, has led to a considerable area paying a fixed rental, sometimes in millet or rice, frequently in sesamum oil. The rentals are paid in unhusked rice or red bean in the inundated tracts south of Mônywa, and in red millet in the western black-soil tract.

The dry-land cash-rented figure is high in the cotton area, for the same reason which makes the dead rent in produce common; and in the western black-soil region, for the reason given above, namely, certainty.

In most parts of the district the people strongly dislike the idea of fixed rents. The feeling is prompted by experience of the uncertainty of the seasons.

Fractional rents. As regards the fraction taken from wet lands, the high fractions are found in old-established tracts, in proximity to markets or with facilities for irrigation. The nature of the soil appears to be a minor consideration. Thus, in the inundated silt lands south of Mônywa and in the irrigated lands along the Yamas, the usual fraction is one-half. The few wet lands in the cotton tract—which is without

irrigation and somewhat difficult of access—usually pay one-fifth or less and along the Mu, where rice is the predominant cultivation and there is an easier means of transport, but markets are not near and there is no irrigation, the fraction is one-fourth. In the less developed tracts in the south-west, the fraction is usually one-third, and the same fraction predominates in the northern half of the district, except where, as in the Chindwin, Yewa and Inbaung valleys, it rises to one-half for irrigation or proximity to markets, or falls, as in the Se-ywa, where remoteness leads to a low fraction, namely, one-fifth.

The considerations which govern the fraction taken from dry-lands are proximity to markets and the degree of development generally, and the quality of the soil The silt soils south of Mônywa on the eastern bank of the Chindwin usually pay a dead rental, in produce; the same soils south of Mônywa on the opposite bank of the river, pay one-half —a high fraction for dry-crop lands—and this is the fraction which predominates in the eastern black-soil tract and on the strip of soil—much of it assisted by silt deposit from the hill torrents—beneath Kyaukka The opposite strip of country, that between the eastern black-soil basin and the Chindwin, mostly pays the next lower of the fractions used, namely, two-fifths. As distance from markets increases and the quality of the soil becomes worse, the fraction falls, and in the Mu-Kyaukka plateau the thirsty, often infertile, uplands usually pay one-fifth or less. In the west and south-west of the district—not yet opened out—the prevailing fractions are one-third or one-fourth, and in the remote Sèywa glen the fraction falls to one-fifth or lower, and in other remote regions, the Kuhnitywa and Thingadôn valleys, most of the rented land is held free of any rental proper, the tenant simply undertaking to pay all the land-revenue demand.

In many parts of the district rentals appear to have passed the customary stage and to be on an economic basis, and subject to the rule of supply and demand. The influence of custom is, however, still to be detected, particularly in the fact that, however favoured, wet lands do not pay a higher fraction than one-half.

Long-harvested crops.

Cotton has been mentioned already. Rentals from other long-harvested crops—brinjals, tomatoes, vegetables—are sometimes fixed; sometimes the tenant estimates the total sale-proceeds at the end of the season, and pays a fraction in cash or unhusked rice or millet; and frequently the landlord merely takes what he wants from time to time for his own consumption.

The duration of tenancies was found to be as follows in 1906-07:— Duration of tenancies.

Area held by	Acres.
One-year tenants	49,882
Two-year tenants	34,491
Three year tenants	37,945
Four and five-year tenants	49,459
Six-year to ten-year tenants	44,404
Eleven-year tenants or over	15,035

Regarding the district as a whole and remembering that all tenants are tenants at the will of the landlord, it appears that the tenant enjoys, without special legislation, a reasonable degree of fixity of tenure. In the tracts with high percentages of rented to occupied land there appears to be at present no tendency to evict tenants. The tract of inundated rice-land south of Mônywa, with almost the highest percentage of tenanted land, was found to have the highest percentage of long-established tenants. The converse was found to hold. Tracts with the highest percentage of short-term tenants had the smallest percentage of tenanted area. The figures suggested that in the best tracts—where much of the land is rented—the landlords do not at present take so high a fraction as to cripple the tenant, whilst, in the remote tracts, the tenants would appear to resign their holdings in spite of low rent-fractions.

Customs of tenancy.

The custom of appraisement, by which the landlord (or his agent) and the tenant visit the field when the crop is nearly ripe, estimate the total yield and the proper amount of it which should be paid to the landlord, according to the fraction at which the land is let, and then agree to delivery of that amount, is found, but not in many places. It is usually disliked, the reasons being that there may be deterioration after appraisement, when the tenant would suffer by having to pay a fixed amount; that it is expensive —for the land-steward, if such a person is employed, has to be paid a commission, which is in addition to the rental proper: and that it is accompanied by abuses. The commission usually paid to a land-steward is two and a half per cent. of the total appraisement. When tenant and landlord fail to agree to the appraisement, it is not the custom to reap a sample of the field: the whole field is sheaf-divided.

Produce division. Produce division is effected in three ways, which are as follows, in the order of infrequency:—(*a*) Plot division. When the crop is ripe, landlord and tenant visit the field and mark it off into the landlord's portion and the tenant's. Each has no further concern with the portion assigned to the other, but reaps his own portion, at his own expense, when he pleases, and retains the whole of the straw from it. This method of division is seldom met with. (*b*) Sheaf division. This usually implies a certain amount of distrust on the part of the landlord. Landlord and tenant visit the field at reaping time, the field is reaped, and—usually after the reapers have been paid their hire in sheaves from the field—landlord and tenant divide the remainder according to the fraction at which the land was let. The landlord usually carts away his portion of the sheaves: his oxen tread out the grain and he takes the straw from his portion. (The straw is usually looked upon as belonging to the person whose oxen tread out the grain.) (*c*) Grain division. The landlord is usually not present. The tenant reaps the whole field, his oxen tread out the grain, and the tenant carts the rent grain to the landlord's house and retains the straw from the whole field. This is the most usual form of produce division and is consonant with the easy-going nature of the Burman, and it indicates the harmonious character of the relations which at present exist—in nearly all places—between landlord and tenant.

In tracts where there is good land and competition for tenancies, like the irrigated tract along the North Yama, the tenant sometimes gives a present to the landlord on entering upon the tenancy, and the landlord frequently exacts services, such as the cutting of firewood, assistance when he is giving an entertainment (*a-hlu*), and the like. If the land is bad, the landlord sometimes gives a present to the tenant at the commencement of the tenancy.

On the whole, the relations of landlord and tenant are harmonious, and there is little rack-renting. In the great majority of cases the landlord accepts the amount of rent-grain which the tenant brings him and asks no questions, and there is no doubt that the tenant often pays less than the exact amount which he ought to pay, if the full fraction on which he holds his tenancy were claimed. This arises in part from the easy-going nature of the people and in part from the fact that there is no well-defined line separating the tenant from the landlord class. A's landlord is as often as not B's tenant, and, if he does not demand the full fraction from A, he will expect to be allowed the same

indulgence when paying his own rent to B.

The total area of estates exceeding one hundred acres was, in 1906-07, 8,610 acres, divided between 34 persons. It is probable that some estates escaped notice. The only very large estate is that of the headman of Mônywa, 3,826 acres. Excluding that estate, the average area of the large estate was found to be 145 acres. There is therefore little indication of the land becoming concentrated in a few hands. Large estates.

CHAPTER IV.—Agriculture and Irrigation.

Agriculture.

The prevailing occupation is agriculture. More than one-half of the households in the district are engaged in cultivation, either as the single or as one of two or more avocations. Moreover, the unskilled labourers are for the most part dependent on agriculture in the form of field labour, either within the district or in Lower Burma at the annual emigration. In the south-west of the district, from the line at which the western black-soil plain begins, there is little emigration and few craftsmen are found. In this part of the district the ordinary household is purely agricultural. Number of agriculturists.

Much of the level, good soil of the district appears to have been long settled. An early Deputy Commissioner, Mr. (now Sir H.) Adamson, writing in 1889, says:—"In many parts (of what is now the Salingyi and Palè townships) are to be seen expanses of cultivated land, as far as the eye can see, on all points of the horizon. Here, too, there is very little waste land, except such as is high-lying and unfit for the ordinary crops, and any small areas of cultivable waste lying between villages are claimed by the villagers as *bobabaing* (ancestral)." Absorption of waste land for cultivation.

The stages by which cultivation has extended are shown in the reports as follows :—1890-91, 179,121 cultivated acres; 1896-97, 295,580 acres; 1902-03, 396,298 acres. The figures are not based on survey and are only valuable as giving a general idea of an undoubtedly large expansion. About 1903-04 the policy of issuing leases in the dry-zone districts ceased, and unrestricted occupation of waste land was encouraged. In the absence of survey figures it is impossible to estimate what stimulus this gave to

extensions. From 1905-06 figures based on survey are available and are as follows:—

		Acres.			Acres.
1905-06	...	442,928	1907-08	...	464,780
1906-07	...	460,093	1908-09	...	519,614

This rapid increase in cultivated area has absorbed most of the good culturable land. In the Settlement year, 1906-07, the area surveyed cadastrally, 2,589 square miles, was made up as follows:—

		Acres.
Area occupied and crop matured	...	435,441
Area occupied, but failed or fallow	...	337,267
Area not yet occupied, and culturable	..	388,298
Area not yet occupied, but not culturable, hillside, stony ground, and the like	...	496,414
Decimals omitted ...	...	2
Total	...	1,657,422

Of the area already occupied, much of the failed or fallow portion cannot be expected to be placed under crop in addition to the existing cropped area; the failed area in the year mentioned was about normal. Of the land not yet occupied and shown as culturable, the major portion is red sandy soil of poor quality, culturable, but probably not regularly nor with the more valuable crops.

There are certain lacunæ, at the time of writing, in the field-to-field or cadastral survey of the district. There is a large area of sandy, high-lying, waterless waste south of the Yewa stream, and an equally large area of forest-clad hillside north of that stream. Neither area contains culturable land of the best quality, and it may be anticipated that extension into the waste will proceed more slowly in future years.

Wet and dry crops.

The favourite food of the Burman is rice, and he will grow that grain to the exclusion of others when the supply of water permits. Under the hills in the rainy west and north of the district the main crop is therefore rice; and, where the flooded river inundates its margins and adds something to the rain from above—a condition of affairs which is best exemplified by the tract of country immediately south of Mônywa—rice again is the standard crop. Nor is it only when Nature, unaided by man, confers the measure of precious water which will fill his fields, either by inundation from a large river or by the rain from heaven, that the cultivator attempts rice. In many parts of the

district, particularly in the west, the cultivator's own effort supplies his field with water. At numerous places along the small streams unambitious dams are placed across the channel, and the waters of the pent-up pool so formed are led on to the cultivated field by means of artificial ducts. The methods of irrigation will be found described in a later paragraph. Where the rainfall is too scanty for the cultivation of rice, and no extraneous supply is available, the cultivator must perforce rely upon a dry crop, and, apart from the vicinity of the western and northern hills and the course of the Chindwin and its affluents, it is usually the dry crop which provides him with food or the means of purchasing food.

Area under the different crops.

In the year July 1906—June 1907, the area on which a matured crop was raised was divided as follows between the chief crops:—irrigated rice, 14,148 acres; unirrigated rice, 74,375; millet, 147,864; sesamum, 105,220; red bean, 21,300; cotton, 18,451; and gram, 9,924 acres. There was very little orchard cultivation. The variety of crops is great, and this brief list ignores all but the main crops. It will be observed that rice takes the third place in point of area. The figures of the area under each crop before 1904-05 were not based on survey, and they are not reproduced.

Double cropping is often attempted, especially in the west of the district, where an earlier rainy season allows a crop of sesamum to be reaped before the main crop of rice or millet is sown. In the same year the area successfully double-cropped was 10,774 acres. Mixed cropping is also practised, and, in the same year, there were 8,540 acres under a mixed crop.

Dry crops on rice land.

Often the rice crop on lands dependent on the rainfall alone fails, or there comes no rain suitable for planting, and in that case the cultivator sometimes plants his rice field with a dry crop. Of such cultivation there was in the Settlement year—

	Acres.
On rice land inundated from a river ...	2,946
On rice land dependent on the rainfall alone or irrigated from weirs or other sources ...	12,578

—15,524 acres in all. Rice land—except in regions where the nature of the water supply renders the soil salty, as in the irrigation near Kudaw—is frequently good for a dry crop, and the dry crops raised on rice lands which receive a deposit of silt from river inundation are especially good.

New crops.

New crops have been introduced, the most important being groundnut, which will produce a crop on the sandy,

poor, red soils of the uplands. Other new crops are:—*pè-sein-sa-u*, a kind of coarse parsnip, on the silt soils north of Mônywa; the intermediate-aged variety of late sesamum, *gya-hnan*, in many parts of the district; Bombay and Calcutta onions along the South Yama; wheat in the black soils on the west, the cultivation being still inconsiderable; and red bean and white millet in the northern half of the valley of the Chindwin.

Normal area of crop failure. The series of years for which figures of the crop-failed area are available is small: the area which was sown, but failed to mature, was, in 1905-06, 12 per cent. of the whole sown area; in 1906-07, 10 per cent., and, in 1908-09, 9 per cent. The figure in 1907-08 was 32 per cent., but that year—*vide* Chapter VIII—must be regarded as exceptiolnal: the average figure, excluding years of exceptional calamity, may be taken to be about 10 per cent.

Dry and wet lands and the main orders of soil. In this district, as in the dry-zone districts generally, there is an essential difference between rice land and dry-crop land; rice land can grow other crops as well as rice; but dry-crop land cannot grow rice,* for it is not carefully levelled and embanked, and rice will not thrive except in levelled fields provided with embankments which will retain water. The orders of cultivation occurring in the district can therefore be grouped according as the fields belong to the embanked or unembanked categories. Within the former fall the many varieties of rice cultivation. Within the latter fails the ordinary dry-crop cultivation of food-grains, oil-seeds, and fibres; orchard cultivation; and the cultivation on inundated land—too much exposed to the force of the river-currents to allow of the cultivator maintaining the embankments of a rice field—of the spring-ripening crops, beans of many varieties, groundnut, onions, tomatces and many miscellaneous crops.

The crop-matured rice land, or wet land, was found divided as follows between the various orders of 'wet' soil, in the year 1906-07.—

	Acres.
Dependent for water on the rainfall only ...	65,009
Inundated from a large river	7,704
Irrigated from weirs and dams	11,689
Irrigated from natural springs and artesian wells	1,579
Inundated from a large river and planted with the hot-weather variety of rice	1,530
Irrigated from a saline stream .	1,361

These figures do not include the area of rice land under a dry-crop, mentioned above.

* Rice will grow on a hillside in a region with a heavy rainfall, but the area so cultivated in the Lower Chindwin district is small.

The dry-crop land was found divided as follows:—

	Acres.
Red soil	215,605
Black soil	104,951
Upland rice cultivation	811
Dry-crop land, without embankments, inundated from a large river	8,485
Orchard land	405

The standard crops in different parts.

In spite of the multiplicity of crops and apparent confusion of agricultural conditions, it is possible to select the customary crop over a compact area, and this is found to depend on two chief factors—the nature of the soil and the nature of the water-supply. In the west of the district the chief crop on embanked land is rice, sometimes preceded by a crop of early sesamum or mixed with a late crop of beans (*pè-nauk*); on the unembanked land, which is a red loam, early sesamum followed by beans rotates in successive years with red millet (*andropogon sorghum*). The day is short in the glens under the high hills, and the late-sown variety of sesamum would not ripen. The Pagyi hills fall rapidly on the east to a fertile plain of black soil. Here the proportion of rice land varies directly with propinquity to the hills, and the crops grown on the wet land are rice, occasionally following an early crop of sesamum, occasionally mixed with beans. The stiff black soil of the unembanked land is, for some three years out of four, under red millet, and in the fourth year the cultivator may put down an early crop of sesamum and follow it with a late crop of gram. On the southern edge of this tract, along the South Yama, maize is grown, and several hundred impermanent wells, sunk along the margin of the stream, supply valuable garden crops with water. This favoured champaign is bounded on the north by Powindaung hill, and between that elevation and the North Yama is found the best irrigated rice land in the district. Most of the fields obtain their water-supply, enriched with the fertile silt of the western hills, from dams erected in the stream, but there are several hundred small artesian springs which give water for an easy, certain, in some cases double crop of rice. The transition from the fertile country south of the North Yama to the arid, sandy, ravine-scarred country north of it is abrupt. Here there is hardly any black soil, little irrigation, no wells, no springs. The depressions in towhich descends the rainfall are terraced for rice, and the unembanked soils are scratched and sown with red millet and sesamum in alternate years. In this part of the district, the line which separates the early

from the late sesamum is sharply defined. In the west, nearer the hills, early sesamum can be sown, but in the east, as the Chindwin is approached, the only variety cultivated is late sesamum, the latest to come to maturity of all winter-ripening crops. North of this arid tract, the hills again close in and bring a heavier rainfall, and rice on the wet land and early sesamum on the dry are the prevailing crops.

The valley of the Chindwin has numerous forms of cultivation. The extensive stretch of inundated rice land south of Mônywa has been mentioned, and smaller stretches of the same species of cultivation are found all along the river on either side. The configuration of the valley is that of a river running in a slightly elevated bed, having on either side depressions which the flood waters of August and September fill, and leave full after the river has subsided to an exiguous stream in the cold weather. Beyond these meres rise uplands of red soil. The depressions have been terraced for rice cultivation from time immemorial and, as the waters subside and evaporate, the higher fields are sown and, later, transplanted with winter-ripening rice. In December this crop is reaped, but the depression still contains some water, and from January onwards the lower tiers, as they gradually emerge, are sown with *mayin* rice, to be thenceforward laboriously irrigated with water baled up from the daily-shrinking pool and finally to be reaped in the heat of April and May, save when a hailstorm dashes the hopes of the cultivator by beating down the ripening ears. Hot-weather rice is an arduous and, in the north of the district, not quite certain crop. All along the river the true islands, as they emerge from the face of the flood, are sown with beans, wheat, and many other crops, which will ripen in March and April. Further inland, where the margins of the mere rise to the limit of the river valley, the red soil slopes are under red millet and late sesamum.

The agricultural scheme east of the Chindwin differs widely from that followed on the west and described above. The smaller rainfall and more ardent sun rule early sesamum out. Beginning with the valley of the Mu river, there is a fringe of low-lying land which, although not subject to inundation, receives the drainage of a sandy high-lying plateau on the west. This fringe is terraced for rice cultivation, and the slopes beyond are under late sesamum, and there is hardly any millet. The plateau itself has no rice cultivation. The crops are late

sesamum, cotton, and red millet; one year of each. It is in this part of the district alone that cotton is extensively grown. The cotton country ends abruptly at the Kyaukka ridge, and in the valley beneath there is a marked change in soil conditions. The torrents which drain the plateau on this side run at first within deeply cut, precipitous walls, but, lower down, debouch on to the plains and inundate the surrounding country and eventually lose themselves by percolation, and none of them reaches the Chindwin. The inundation, although liable to wander from year to year, confers fertility on the soil, which is, for the most part, red, and the chief crops are white millet, red bean and late sesamum, and there is little rice cultivation. Further north, between the Kyaukka watershed and the Chindwin, is an extensive stretch of black soil, which has been mentioned in Chapter I. As in the western black-soil region, the favourite crop here is red millet, but the rotation crops are gram and late sesamum; there is no early sesamum. To the north, this tract ends beneath the volcanic ridge which is dominated by Twin hill, east of the Chindwin. North of this tract, near Kudaw, village irrigation has afforded the chance of a rice crop, and the cultivation presents the aspect of a gently-sloping plain of terraced rice-fields. To the north-west, there is no level country, all crops are precarious, the valleys are terraced for rice, and on the gravel-strewn hillsides scanty crops of sesamum and red millet often hardly return the seed sown. North of this again the northern hills are approached. The teak tree becomes a familiar object in the landscape and rice resumes the first place in the agricultural scheme.

The average area of the holding.

There are no authentic figures of the average area of a cultivator's holding.

Agricultural advances.

Government advances made under the Agriculturists' Loans Act (*takkavi*), for the purpose of commencing or extending cultivation, are utilized freely. The average disbursement for the four years ending with 1907-08 was Rs. 45,000. Up to the present, cattle have not been accepted as security, the guarantee of landed property held in full ownership and in possession being required, *i.e.*, land held on usufructuary mortgage cannot be offered as security. The usual period of repayment is two years, and loans have generally been given out in June. This date is somewhat late, as agricultural operations are then just beginning.

No remission of these advances has been sanctioned in any year.

No loans have been made under the Land Improvement Loans Act.

Modes of agriculture. The agricultural year commences officially on the first day of July, but preparations for the new season begin in April or May. If the cultivator lives in a rice-growing tract, his holiday began before the middle of January, when the last of the rice left the threshing-floor; if in a dry-crop tract, it may have been a month later before the threshing-floor was cleared of late sesamum. A plough bullock may have to be purchased. The harrow-teeth must be looked through, and a stock cut from the wood of the *dahat* (*tectona Hamiltoniana*) or the cutch tree (*acacia catechu*). The cultivator will not—in the red-soil regions, at any rate—require to go far to find these trees growing in the jungle. The uprights which confine the neck of the harnessed bullock are easily broken; the same journey which brings back the wood for the harrow-teeth brings also a stock of uprights, and probably a spare cross-beam for the harrow, in case of accidents. These and all the wooden appurtenances of husbandry are for the most part cut and fashioned by the cultivator himself; it is only the wealthier, less energetic cultivator, living in the developed tracts near Mônywa and the larger villages, who finds it too much trouble to prepare his own implements. The pagoda and spirit festivals which have followed one another in close succession from November, when the heavy rains ended, have given frequent opportunity of purchasing, and there is, besides, a regular trade carried on by the cultivators in the northern wooded tracts on the Shwebo border, who come down every spring to Mônywa and the neighbourhood with cartloads of shaped harrow-teeth, cross-beams and the like, for sale. There are the ropes to be looked to—those which pass through the nostrils of the harnessed cattle, others which confine the neck of the bullock to the uprights fixed in the yoke-beam; and those which serve the purpose of reins. These the cultivator often twists for himself out of fibre that he has gathered in the jungles. His cart will be in frequent, and early, use, for one of the first operations of the new year will be to convey manure from the byre to the field. The cart therefore requires inspection. The stock of carts in the district in the year 1907-08 was 27,561; 35,724 families were recorded as cultivators in that year, so that some three out of every four cultivators owned a cart; not all of them the easily-running, modern cart, with spoked wheels and

iron tyres, but the greater number are of this kind, and it is only in the backward tracts that the creaking, antediluvian cart is met with—its wheels fashioned either out of a solid disc of wood, the section of a tree trunk and as much square as round, or of a patchwork of two segmentary pieces and a middle slab. These older carts are now seldom made, and it is every cultivator's ambition to buy a cart of the new fashion. Seed, if none was put by from last year or if a new variety is to be tried, must be purchased.

When all has been looked to and the *thagyansa* * consulted to see whether the early rains are likely to be good or bad—a pious observance which in no way deters him from sowing with the first favourable showers, whatever the prophets may have said—the cultivator waits for the rain, and at the end of May or the beginning of June harrows his field and sows his early sesamum, if his village is not too far from the western hills. The early rains are not used for an immediate sowing east of the Chindwin, except of *pèdi* and cotton.

The modes of agriculture are time-honoured. The general custom is to put seed aside at reaping for the next season. This rule applies to seed of all crops, and the good is separated from the bad. There are, however, several places from which it is reported that no seed selection is made, and it is not in all places that every sort of seed is selected. A common practice is to mix seed with earth, ashes, or sand, in order to prevent the ravages of insects, and the receptacle in which the seed is set aside is sometimes covered with a piece of cloth and a layer of ashes placed above. Rice seed is sometimes covered with a layer of straw and cowdung.

It is only in the inundated areas along the large rivers, where a layer of stiff silt is deposited annually, that the plough, with a share, is used. The implement is fashioned of wood, and the share is often steel-shod. Everywhere else, whether for rice cultivation or for a dry crop, the seed bed is prepared by means of a wooden harrow, though the cross-beam of the harrow used on rice-land is in many places less massive than that used for dry-crop cultivation. Roughly-fashioned wooden teeth, varying in number from three to seven, are inserted in the cross-beam, from which run shafts connected with a yoke which is placed upon the necks of the plough cattle. A bow of bamboo rises

* The prediction of the events of the coming year, published by the Mandalay astrologers in April, at the beginning of the Burmese New Year.

vertically from the cross-beam, and the ploughman supports his back against this whilst directing the cattle. The custom of giving a field an occasional ploughing is not followed: the harrow alone is used, year in and year out, except on silt soils. The choice of deep or shallow harrowing is governed by the nature of the soil: the sandier the soil, the shallower the tilth. This is the general rule, but stiff black soils are not ploughed deeply. The method of deepening the tilth is by removing some of the teeth from the harrow. The harrow as often as not serves the triple purpose of preparing the tilth, of uprooting the weeds which spring up between the first harrowing and the sowing of the seed, and of thinning out the plants when they have attained some growth.

The plough cattle are nearly always bullocks. Under the hills, where a heavier rainfall fills the rice fields abundantly, along the large rivers, where inundation produces the same result, and in some places where there is irrigation, the fields become so deeply water-logged that bullocks cannot draw the harrow. In these places the water-loving buffalo takes the place of the bullock in ploughing the wet cultivation, but, over the whole district, the relative number of buffaloes is small: the figures for the year 1906-07 were—

Bulls and bullocks in the plough	...	85,498
Buffaloes in the plough	...	6,211

Cows are seldom seen drawing the harrow. Occasionally, when an outbreak of disease has carried off his bullocks or a season of scarcity compelled him to sell them, a cultivator may be seen driving a heterogeneous team of cows and calves, sometimes four abreast in the yoke, but it is the exception. Cow buffaloes are, however, as strong as the male, and take an equal share of the labour in the moister parts of the district, where buffaloes are used.

Nearly all crops are broadcasted, the exceptions being rice on embanked land, occasionally rice on unembanked land (upland rice), chillies, red bean (usually), groundnut, and—very occasionally—white millet.

Weeding, where it is not done by means of the harrow, is effected by hand, and there are varieties of the weeding hoe. One, wielded in both hands, is brought down from above with a chopping and drawing action; another, also long-shafted and requiring the use of both hands, is pushed through the soil; the single-handed small hoe, in shape not far removed from a trowel, is also used. All these articles are of local origin; the shaft is usually cut by the

cultivator in the jungle; the iron head is purchased at one of the pagoda festivals, from sellers who have bought a supply in one of the villages where blacksmiths congregate. When use has worn away the edge, the itinerant forge serves to put on a new edge of hard steel.

Reaping is performed by means of the curved sickle, with a rasped, sawing edge. That, too, is locally made. All crops are reaped. There is no custom of uprooting the whole plant.

In some parts of the district it is the custom to prepare the threshing-floor in a corner of the reaped field; in others, the fields round the village-fence are used; in others, the house-enclosure serves the purpose. The soil of the floor is harrowed and watered and smoothed, and often leeped with cowdung. The valuable sesamum crop is always beaten out on a floor which is very carefully smoothed. The sheaves of rice and the heads of millet are arranged in a circular swath on the threshing-floor, and the plough cattle are driven round and round and lazily tread out the grain. There is no Buddhist precept forbidding the muzzling of cattle during this operation, and they are more often muzzled than not. The final operation is winnowing, and this is performed by elevating the grain on trays and pouring it on to a mat below; the wind carries away the chaff and extraneous particles. The grain is then carted to the house and placed in a large cylindrical, or occasionally square-shaped, bin, the *sabagyi*, made of bamboo wattle.

In the more developed parts of the district, where money is easily come by, the operations of husbandry are often carried out by means of hired labour. As civilization recedes, there is less hiring; when the cultivator and his family do not suffice for the necessary work, their friends and neighbours give them a day's help, and the assistance is returned later on. The custom is known as *letsa*, mutual labour. Where hiring is the rule, the rates vary according to the village custom and the nature of the work, and, occasionally, the sex of the labourer. Sometimes the payment is in kind, sometimes in money, sometimes partly in kind and partly in money; usually one, sometimes two, occasionally even three meals are provided, and these are taken along with the family. Often the farmer must provide so many cheroots, or some betel leaf and areca nut, or some pickled tea, for the labourer's refreshment. It would not be far wide of the mark to say that the usual rate of hire for a man for field labour is equivalent to five annas a

day, and for a woman three annas. There are certain kinds of labour which are peculiar to a sex. Women only bed out the rice plants, an operation during which they may occasionally be heard singing—to lighten the labour—in what to a Western ear is an astonishingly doleful recitative. Only men pull up the rice seedlings; and it is a woman's task to top the millet plants. The other operations are carried out by men and women alike. Women are, however, rarely seen ploughing.

The rotation of crops has been mentioned. The periods in the rotation vary with the capabilities of the soil; as a general rule it may be said that—except in tracts where rice is the main crop—millet will be grown on the dry soil as long as the land will stand it. The reason is that millet provides food for the cultivator and fodder for his cattle, and he therefore prefers it to sesamum—a more precarious crop—although the profit from the latter in a good year is greater and the cultivation of it less laborious. Where the main crop is rice, there is not the same preference for millet; so, along the Mu, and in the west, the dry-crop lands are chiefly under sesamum.

Manure. No use is made of cowdung for domestic purposes, such as making cakes for fuel. It is, however, used in leeping rice bins and to level and fill the cracks on the surface of threshing-floors. No trouble is taken to store the manure in pits. It remains in the byre until it is carted to the land at the commencement of the cultivating season. Nothing is done to preserve the liquid constituents of the excreta. They are allowed to run to waste, and litter is hardly ever used. The general custom is to apply the manure to the land before ploughing; in some places it is deposited in heaps on the field as early as March, but in most not until May or June. Where the supply of manure is sufficient, it is applied both to rice and dry-crop land. There are, however, places where little use is made of manure. In inundated rice land, manure is occasionally ploughed in before the water enters. When the supply is insufficient for both wet and dry lands, the rice lands have the preference. Fresh manure is used as well as old, except in a few villages, where only old manure is used. As a general rule, cattle are not turned out on the fields to manure them, but in many places cattle are folded on dry lands during the rains in order to avoid the mud and slush within the villages and, incidentally, their excreta benefit the soil. The position of the folds is in some places—notably the stony, infertile cotton region—changed every few days, and here the primary

purpose of folding is that the manure may fertilize the soil. In most cases cattle manure is the only fertilizer used; village rubbish is, however, occasionally utilized and is generally burnt. Bushes growing on dry-crop land are also sometimes cut down and burnt for manure. Very rarely, oil-cake is used as a manure. Silt is never applied, except to the betel-vineyards in Nyaungbyubin, south of Mônywa. Cattle manure is not burnt before application to the soil. There is hardly any sale of manure. The stubble of crops is grazed down by the cattle, whilst the roots remain in the ground and help to enrich the soil. As the custom of using cow-dung cakes for fuel is unknown, practically all the contents of the byre go on to the field.

Furrow irrigation is practised in onion cultivation. Pump irrigation is unknown. Millet stalks are chopped by hand for cattle fodder—a laborious task. One or two machines, after the type of the chaff-cutter, are in use, and it would probably prove remunerative to exploit them systematically in the millet-growing tracts. Reaping is done by hand. A simple reaping machine might succeed in the black-soil tracts east and west of the Chindwin, where there are extensive level stretches under millet, uninterrupted by field hedges or embankments. There is a substantial body of opinion—the outcome of generations of experience—that the fertility of the soil for next year's crop is increased by a bean-crop, but assent is not universal and is sometimes qualified. The fertility of the soil is generally believed to be the same as in Burmese times, and the belief that the outturn is less than it was follows on the idea that the rainfall, not the soil, is deteriorating.

Description of the Chief crops rice.

The people classify the numerous varieties of rice broadly according to age. The shortest-aged variety is reaped some three months, and the longest some four and a-half to five months, after sowing. On inundated lands, high-lying fields are sometimes broad-casted before the river-water enters and reaped after they have subsided. These fields are not transplanted. The lower-lying fields are ploughed once or twice before inundation, harrowed after the water has receded, and then transplanted with seedlings taken from the nurseries, which have been sown after the first heavy rain in the highest-lying fields, out of reach of inundation. It is in these lower-lying fields that the longer-aged varieties of rice are grown. Their water-supply is more certain, but they are not exempt from the risk of being drowned by a late rise of the river in September or October.

The processes of cultivation in rice lands which depend on the rainfall alone are similar, except that they are never ploughed; only the harrow is used. The outturn of a transplanted being greater than that from a broadcasted field, the cultivator always transplants, if the rainfall favours him. He will, if possible, sow in a wet seed-bed and transplant to a wet field. But rainfall is often scanty, and he may be compelled to sow in a dry nursery and—whether he has sown in a dry or a wet nursery—to watch his seedlings withering under a hot sun and be left, when the heavy rain falls and fills the fields, with no seedlings to transplant. All that he can then do is to broadcast the field without the possibility of transplanting later, for the season is now too far advanced for that.

Of the rice-growing regions the following are, at present, the best: the irrigated land along the North Yama stream; the inundated tract south of Mônywa; the irrigated tracts along the South Yama and the Yewa; the hot-weather rice lands along the Chindwin in the north; and the rainfall rice lands along the Inbaung and in the eastern black-soil area.

Dry crop land. Of the dry-crop lands, wherever silt is present the land is of value; and, apart from silt soils, the black-soil tracts are generally more valuable than the red. The largest compact areas of silt soil are found south of Mônywa, on the east bank of the Chindwin, and between Letpadaung and Ngakôn on the west bank.

In the west of the district a few fields are found under upland rice, broadcasted soon after the first rains and reaped in September. This form of cultivation does not require a level, embanked field, as the rainfall near the hills suffices to mature the crop. The mode differs from the ordinary cultivation of rice on hillsides in hilly regions, only in that a gentle slope or a fairly level depression is selected.

Millet. The method of cultivation of *kunpyaung*, the red millet, in the south-west of the district, where large areas of black soil are under this crop, is as follows:—The seeds are not selected with care. The topped ears for next year's sowing are taken from the field and exposed for from ten to fifteen days and nights on the threshing-floor outside the village. They are then trodden out in the usual way, and are placed aside in any convenient receptacle in the house. The seed-grain is liable to depredation from insects (the rice weevil) and rats, and the receptacle is occasionally, but not often, covered. Ashes are not mixed with the grain. Grain more than a

year old is believed to lose its germinating power. The grain is not beaten—to separate the husk—before sowing.

Preparation of the soil.—The soil is never ploughed: the seven-toothed harrow alone is used, and with this the soil is stirred, in order to remove weeds, as soon as the early rains fall. The seven-toothed harrow gives the shallowest tilth, and the stiff black soil does not call for deep ploughing.

Manure.—The fields are not manured: the contents of the village byre are either burnt or used for the wet cultivation, and cattle are not folded in the fields. The fields are never fallowed, and on the better soils millet can be grown up to three or four years in succession, when a crop of late sesamum or gram, or of early sesamum followed by beans, is taken.

Sowing.—Seed-time lasts from the beginning of July to the end of August. The seed is broadcasted and a seven-toothed harrow drawn over the field immediately, in order to cover the seeds with earth. The seed in the earth is said not to be subject to depredation from pests, but the young plant is attacked by the cockchafer grub.

Between seed-time and harvest.—As soon as the plant is a few inches high the field is thinned once with the seven-toothed harrow: it is also weeded by hand, and when the plants are from one to two feet high the field is again harrowed, partly to thin out the crop which, if too thick on the ground, dies or gives a diminished yield, and partly to remove weeds. It is also occasionally hoed with the hand-hoe; when the plant has grown tall, the weed growth is removed with the sickle. No pruning of the leaves is carried out. The crop is not watched. In this region there is no jungle growth to afford shelter to birds, and no fear of depredation from the larger animals.

Diseases, etc.—Smut, *hmo-kyet-taung*, causes the grain to turn from bright red to greyish black, and the outer integument fills with a black powder. The stalk occasionally snaps with heavy rain or wind, when the ear is lost. Heavy rain and wind also lay the plant, but if a bent or laid plant is tied up to a standing neighbour, no damage is done. Certain insects damage millet, *vide infra*.

Harvest.—The crop is reaped with the hand-sickle in January and February. Rarely, the harrow is driven through the plants to lay them and facilitate reaping. The stalks are at once topped and when, after a varying interval, all the stalks from his field have been topped, the cultivator carts them to the threshing-floor and his oxen, which are usually muzzled, tread them out. The threshing-floor is

prepared in the manner described above. The winnowing presents no peculiar feature.

Sesamum. The dividing line between early and late sesamum follows approximately the eastern boundary of the western black-soil tract. Early sesamum is usually followed by a second crop of beans (*pènauk*) or gram, or, less frequently, millet.

There are two main varieties of late sesamum—(*a*) late sesamum proper, a 90-day crop ; (*b*) intermediate late sesamum (*gya-hnan*), a 75-day crop. The latter is replacing the longer-aged variety—on all except the black-soils—in the tracts east of the Chindwin.

The following note has been compiled on the cultivation of late sesamum east of the Chindwin :—The eight principal kinds are : (1) *hnan-net-gyi*, the seed of which is black in colour ; (2) *thadunbyu*, whitish ; (3) *bôkmwe*, maroon ; (4) *gawya* ; (5) *shanga-le* ; (6) *padetha* ; (7) *gwado*, all of which are whitish ; (8) *gyo-lè-byauk*, grey. Of the above, 5 to 8 are grouped as *gya-hnan*. *Hnan-net-gyi* and *thadun-byu* are the most common. There is no careful selection of the seed. Seed is put away in an earthen jar, the mouth of which is covered with a piece of cloth on which is placed sand or ashes, up to the level of the rim Cultivators of large holdings keep their seed in a *pôk*, a large, open-mouthed, bamboo basket, well leeped with cowdung.

The field is cleared of weeds by a double or triple harrowing with the seven-toothed harrow. After the first rains, it is harrowed two or three times with the four-toothed harrow, twice with the three-toothed harrow, and is then left until more rain has fallen. The field is harrowed thus not less than four times, the favourite interval being ten days, but this is governed by the rainfall. If the field happens to grow weeds during a long dry interval, it has to be harrowed afresh ; the more harrowings the better. A field of one acre can do with ninety to one hundred baskets of cowdung ; old well-rotted manure is preferred. The best means of fertilizing the soil is considered to be folding cattle on the field. Dusty and sandy soils are manured, but black-cotton and silt soils not.

The seed is broadcasted and the field cross-harrowed twice or thrice with a three-toothed harrow, in order to cover the seed. An acre takes about one *pyi*, one-sixteenth of a basket, * of seed. Indifferent cultivators and women call in a skilled cultivator to sow their fields, and repay the service with weeding, herding or the like. The sower is

[1] In capacity a little less than nine gallons.

seldom willing to give his assistance for hire in money or grain, but usually asks for repayment in service.

Weeding is done—usually before sowing—when the soil is damp; the small weeds are removed by hand, the large by means of the hoe. There is little weeding after sowing. Very occasionally, however, a field is gone over with the four or three-toothed harrow. *Pwinbyu*, the small white-flowered weed which is popularly supposed to do so much damage to millet, does not harm sesamum.

When the leaves along the lower part of the stalk become yellow and fall, the field is reaped with the sickle. Reaping is done in the morning, for if the plants were cut in the heat of the day the seeds would fall from the opened pods. The stalks, after reaping, are carted to the threshing-floor. They are heaped there for three days, so that all the pods may become well ripened. On the fourth day, the stalks are thinly spread over the surface of the threshing-floor, to dry in the sunshine, and on the fifth day they are threshed with a flail. After four such threshings the stalks are placed aside. The fallen seeds are gathered up, heaped, and passed through a sieve, which collects most of the leaves and extraneous matter, and are finally winnowed.

The field is cleared of weeds with the seven-toothed harrow at the end of April and, if the soil is of inferior quality, cowdung manure is deposited in small heaps, to be ploughed into the soil subsequently. The heaps are never burnt. If the soil is naturally rich, it is not manured, lest the plant should grow rank and throw out fewer bolls. There is no custom of selecting seed. Seed is purchased, either, at eight annas for a basket, from the households which spin and weave country cotton cloth in the villages or—and this is the prevailing custom—from Myinmu in Sagaing district, the seed in the latter case being imported from the Myingyan mills. Seed is sold in Myinmu at the rate of one rupee for ten viss (thirty-six pounds). Five viss of seed are equivalent to one basket in capacity, so that the price of the two purchases is the same. But the Myinmu purchase has to be carted for varying distances, and the seeds are also considered inferior to the village product, as they have to be sown half as thickly again. As soon as the rains commence at the end of May, the field is harrowed twice with the four-toothed harrow and is then left until the next burst of rain, when it is again harrowed, with the three- or the four-toothed harrow. Immediately after this final harrowing the seed is broadcasted, and the field cross-harrowed to cover it. The plants grow to a height of about

Cotton.

one span in a month from sowing. The field is then weeded with the hoe. The rates of daily hire are four annas for a man and two annas for a woman, in addition to two meals. If rain follows, the field may require a second, occasionally even a third, weeding. A well-grown field gives six pickings, the fourth picking yielding most. The average yield from a field sown with one basket of seed is as follows—at the first picking six viss, second eight viss, third ten viss, fourth twelve viss, fifth eight viss, and at the final picking about four viss. The customary hire of labour for picking cotton is one-tenth of the pick, and no meals are provided. Only a small amount of the yield is spun for use as coverlets and jackets. The seeds are not now used as fodder, and oil is not extracted from them. It is naïvely admitted that the weight of the cotton is increased by watering, the excuse given being that the purchasers use false weights and the device of watering corrects the injustice.

Most of the crop is sold in advance to Messrs. Jamal Brothers' brokers from Myinmu, who sell the seed for next year's crop, as already noticed. The highest village prices are those prevailing in December, and the bulk of the crop is picked in October and November. The expense of carting the cotton to Myinmu is borne by the cultivator or the purchaser, according to the terms of the particular contract. If the crop fails and cotton cannot be delivered then the contracted amount is valued at the price prevailing at the date upon which delivery should have been made, and so much money has to be paid. The brokers will not buy ginned cotton, without the seed.

The great cotton (*wa-gyi*), a three-years' plant, is found in a few fields here and there, but is nowhere habitually grown.

Red bean.

The following description of the cultivation of the red bean applies to the inundated tract south of Mônywa:—Not much attention is paid to selection of seed. When the seed beans are selected and not purchased, the better-looking of the trodden beans are dried in the sun for two days and placed aside in an uncovered receptacle. Depredations are not expected, whether from insects or other vermin. Before the river water enters, the field is harrowed and then ploughed, and after subsidence it is ploughed and harrowed. The soil is silt, and does not require manuring. The field is given a final three-teeth harrowing and the seeds, three at a time, are dropped in the furrows so left, at intervals of about eighteen inches. As the sower progresses he draws with his foot a light covering of earth over the seed sown.

The seed beans are seldom broadcasted, but the maize with which in this tract red bean is almost invariably grown mixed, is thrown broadcast. The field is weeded once with the long hoe. The maize plants are cut when young for fodder, and that their shade may not impede the growth of the bean, which is, when ripe, reaped with the sickle close to the ground. The plant is ripe when the pod turns dry and yellow. The bines are trodden out by cattle in the usual way. The field is not ploughed after harvest. The white bean (*pè-byu-ga-le*), Phaseolus lunatus, is in the plant indistinguishable from the red bean. It is not extensively grown, and the methods of cultivation are the same as of the red bean.

Groundnut. Groundnut is also grown on the silt soils south of Mônywa. The two chief varieties are known as the Large Chinese and the Small Chinese (*talôk-gyi* and *ga-le*), the only difference between the varieties being that the Large has a larger and better-looking pod. Next year's seed pods are carefully selected, for size, in the pod, sun-dried for six or seven days, to prevent them getting musty, and placed aside in a covered receptacle, to guard them against rats. Depredations of insects are not expected, and no other precaution is taken than covering the pot or basket. The field is ploughed in the same way as for the red bean, but to a greater depth. A few days before sowing the seed pods are shelled, being tapped with a stick until the husk is separated; sowing is done in the same way as with the red bean. The field is hoed twice with the long hoe, on the first occasion to remove weeds, on the second to bank up the earth over the branches and so protect the young pods from crows. There is no manuring, as the soil is silt. Some cultivators arrange cotton threads across the field to scare the crows away, and the crop is also watched during the daytime. The long-handled hoe is again utilized to grub up the whole plant when ripe. The bines are taken to the house and the pods stripped by hand. Such pods as are left on the ground are gleaned without payment by the first-comer. The field is not ploughed after harvest.

Pèdi. This bean, which when ripe has a slender black pod about three inches long containing small beans of a green colour, is grown as an early crop on the reddish soils east of the Chindwin. The bean in a good year throws out three crops. In some localities it is sown mixed with the large white bean (*pègyi*). The *pèdi* ripens in the rainy season, whilst the white bean is not picked until December and January.

Onions. Onions are cultivated in four ways: (*a*) without irrigation, in pure silt soil, south of Mônywa, often for sale green as spring onions; (*b*) with irrigation (flush) from training-banks; (*c*) with irrigation (lift) by means of trough-lifts (*ku*) and swing-baskets (*kanwè*): these two methods occur along the South Yama; (*d*) with irrigation from wells, by means of the bucket and lever. This method is found in many places. The following note on the cultivation of onions at Ngakôn on the South Yama was recorded by Mr. S. A. Smyth, I.C S., Assistant Settlement Officer. The cultivation is most extensive in this region and the methods of irrigation in use are (*b*) and (*c*) above:—

Varieties.—The onions planted are mostly *kyetthunni*, or red onions, of which there are several varieties. The following are the chief:—(i) *Shan.*—This is the commonest sort: each plant produces from five to ten different shoots and bulbs; (ii) *Meiktaung.*—This variety produces three or four separate shoots and bulbs; (iii) *Meikkwè* (or Burmese), also produces three or four separate bulbs; (iv) *Katta* (Calcutta), which produces two or three separate bulbs of a good size. This variety was introduced by a native of India who had settled in Ngakôn; (v) *Bônbaing* (Bombay), which has a single large bulb to each plant: this is also a recent introduction. A few plots of *kyetthunbyu* (white onions), which are similar in appearance to leeks, are also planted. They are preferred to red onions for culinary purposes and are more pungent, and they command a considerably higher price. The bulbs only are used, the leaves being thrown away. Only one bulb is produced by each plant, and the yield is not so large as in the case of red onions.

Preparation of the soil.—The preparation of the soil is a tedious and troublesome business, and the area which can be prepared by the owner of a pair of bullocks does not exceed two acres or thereabouts. Those who possess a supply of manure place seven or eight cartloads per acre on the land, about the end of May. Ploughing begins a month later. The ground is first harrowed several times, beginning with a seven-toothed harrow and reducing the number of teeth by one at each harrowing, the number at the last harrowing being three It is then ploughed with a *htè* or proper share, and left to the action of the rain. From July to October it is harrowed occasionally with a six-or seven-toothed harrow, in order to keep down weeds. The planting of the ordinary kinds of red onion takes place at the beginning or end of December, according as the late rains

cease early or late. Before planting can take place, the soil, if it is silt, must be subjected to a repetition of the process of harrowing and ploughing carried out in June and, in addition, the clods must be broken by the alternate use of a harrow and a clod-crushing log (*cheik*). If the soil is coarse, ploughing and clod-crushing is not required, and one or two turns with a six-or seven-toothed harrow suffice. When the ground has been reduced to a fine state of tilth it is left for five or six days and then harrowed again. It is then ready for planting.

Planting.—Twelve persons are required to plant ten baskets of seed onions in a day on coarse soil. One man divides up the ground into small compartments called *chin*, each about twelve by seven feet, surrounded by small ridges of earth, and separated from each other by channels, to be utilized later for the conveyance of water. A second constructs furrows in the *chin*, either by drawing a three-toothed harrow across them himself or by driving bullocks across them with a seven-toothed harrow. In these grooves ten women plant the seed bulbs, and cover them up. Working in this manner, two acres can be planted with an expenditure of thirty baskets of seed bulbs in three days. Each basket of seed bulbs weighs ten viss and costs the cultivator anything from Rs. 1-8-0 to Rs. 4 a basket, if he has not been fortunate enough to save from last year's crop. On silt soil the planting of seed bulbs is easier than on coarse soil, and about six women can plant ten baskets in a day.

The *Katta* and *Bônbaing* varieties are generally grown from seed, which is sown in nurseries towards the end of October. These varieties require to be planted somewhat earlier than the indigenous sorts, and they are also longer in coming to maturity. The transplanting is carried out when the nursery plants are about six inches long.

Subsequent cultivation—Too large a supply of water is fatal to newly planted onions, and it is generally a month or thirty-five days after planting before the first watering is given. After this, water is supplied at intervals of twenty or twenty-five days, as it becomes evident that more water is wanted. It is reckoned that, at most, five waterings suffice for the indigenous varieties. For *Katta* and *Bônbaing*, a more frequent supply is necessary, and as many as ten waterings may be given. White onions require the same amount of water as the native varieties of red onion. As soon as the bulbs form and the crop is approaching maturity, larger supplies of water are given at

each watering than at the earlier stages of growth. One man can raise enough water with a trough or basket-lift in three days to water two acres of onions. The same quantity of water is required by onions planted on silt and those planted on coarse soil. Besides watering, it is necessary to weed the beds repeatedly, as fresh weeds come up after each watering.

Harvesting and sale.—The crop is mature at the end of April, when it is dug up and removed to the cultivator's house in carts. The leaves, which are yellow and withered when the crop is ripe, are removed, and the onions are ready for sale without further preparation. An average crop on two acres is 3,000, and a good crop 4,000 viss. A labourer can dig up the bulbs from an area sufficient for planting 1½ baskets in a day on silt soil, and in one-third less on coarse soil. Onions decrease gradually in weight, if kept after harvesting. A crop of 3,000 viss dug up in April does not weigh more than 1,500 viss in December. If the quality of the crop is poor, a still greater decrease may take place. Onions are always sold by weight. Purchasers come in boats from Mônywa, Myingyan, Pakôkku, Myinmu and other places, and buy at Ngakôn. There used to be extensive trade with boats from Lower Burma, but this has fallen off of late. Many of the more prosperous cultivators hold up their onions for a rise in price. Some sell to cultivators who require seed in December, and cultivators who cannot pay cash for the purchase engage to repay the amount in onions in April at the rate of 100 viss for every Rs 4 or Rs. 5 worth of seed.

Rates of hire of labour.—The rate for planting, weeding and working a trough or basket-lift is four to six annas *per diem* (according to the demand for, and supply of, labour), with morning and evening meals, for each man employed. For digging, the rate is said to be eight viss of onions a day, together with the morning meal and some refreshment—palm-sugar and the like. Women receive for planting and weeding two annas *per diem* and one meal.

Miscellaneous.—Onions are often planted year after year on the same ground; but the crop deteriorates unless rotation is practised. The best results are obtained by planting onions every third year, and rice in the intervening years. Onions are attacked by two diseases: one appears in the form of spots on the leaves, beginning at the tips and descending to the bulb. The spots are like the spots on the trout-spotted lizard, *taukte*, and the term applied to the

disease is therefore *taukte kyathi*. This is a disease of old standing, but within the last few years another has appeared which attacks the bulb and roots. The roots become brown and the bulbs and leaves turn yellow and shrivel up. Both diseases are attributed to insects, which have, however, not been seen by the cultivator, so that the etiology remains doubtful. The water for the cultivation is derived from a sand-training bank in the South Yama, which also supplies Linzagyet. Fields that lie too high to allow of the water entering flush are watered by means of the trough-and basket-lifts. Higher up, the Yama stream gives way to well irrigation.

Plantains. Plaintains are usually a three-years' crop, and the varieties favoured are the coarse kinds, *pi-gyan* and *yakaing*. At the end of the three years, the stumps are grubbed up, and the plot is placed under a field-crop. The gardens are usually found on silt soils along the banks of streams.

Betel-vine. The cultivation of betel-vine, the leaves of which are used as a wrapping for the areca nut which is consumed by all Burmans, occurs in homestead plots in Nyaungbyubin, Thitsein and Mayogôn, south of Mônywa, and—to a small extent—in Twin village east of Shweza-ye, Alôn, and in Ngwedwin near the Mu. The description is of the method of cultivation followed in the villages south of Mônywa:—The plants are generally put in in the month of July. A vineyard of five hundred uprights covers about ·04 of an acre, and the bed takes sixteen *kyin* of silt soil. A *kyin* is one hundred cubic cubits. After the soil has been deposited, it is left for a year in order to settle down. The surface is then harrowed for a morning. The soil is not manured. After levelling, the surface is divided into five compartments which are marked with bamboos and at intervals along the boundary of each compartment posts are driven in, each having a length of twelve feet and a girth of sixteen inches. These main posts are usually made of wood of the cutch tree, but sometimes sections of the *tari* palm, *borassus flabelliformis*, are used instead. At a height of ten feet holes are bored and cross struts, each a foot in length, inserted. On the strut on each side a bamboo is placed horizontally and tied to it with strips of the leaf of the *tari* palm. In the avenue between each two rows of main posts two small parallel channels are dug, and in them the young plants are bedded in a line. The young plants are at first trained up small sticks, and in order that their heads may not droop, are tied loosely to the sticks with dried strips of plantain leaf. They are sprinkled with water

three times a day. At the outset the vineyard is shaded overhead with dried cocoanut leaves, which are placed on bamboo rafters tied to the top of the main posts. When the new roots strike, long bamboo uprights are driven in by the side of the small guiding sticks, which are removed, and the uprights are tied to the horizontal bamboo above with dried strips of palm leaf. The plants on being transferred to the uprights are tied to them, to prevent drooping. After the transfer, the small channels are watered daily, morning and evening, from a well, the water being raised by means of the bucket and lever and conveyed to the vineyard in a trough made of the hollowed-out trunk of a palm.

The vineyard begins to thrive in about a year, when the leaves can be picked. At the first picking, the yield of a vineyard of five hundred uprights is about ten viss, or thirty-six pounds. The second takes place after an interval of twenty days, and the produce is about twelve-and-a-half viss, and the same amount is yielded at the third. The leaves are picked three times in two months. At later pickings the produce gradually increases to fifteen viss. After December the yield steadily decreases to eight viss. The diminution is ascribed to the increasing heat. Altogether, a vineyard is picked about eighteen times in the year. The yield in succeeding years follows the same course. At the end of the third year the plants are old, they are detached from their supports, coiled up, and the coil is embedded in the ground at the foot of the upright. New soil is laid on the old bed and the new growth commences from the scion of the old coiled plant. The leaf finds a ready sale in Mônywa and at the Satôn bazaar, west of the river.

***Borassus flabelliformis*, the *tari* or toddy palm.**

The *tari* palm grows in large numbers in the south of the district along the western bank of the Chindwin: on the Mu-Chindwin plateau: round Okpo: and south-east of Natyedaung.

The number of palms was counted in the year of Settlement, 1906-07, and there were found to be:—climbed in that year for the sap, 164,267; unclimbed, 594,019; total, 758,286. Of the unclimbed trees, it appeared that a very large number was sap-bearing. The amount of fuel consumed in boiling down the sap of the palm to sugar is large, and it is usually held that the industry entails a destruction of tree-growth which may be leading to deterioration, either in the actual amount of the rainfall or in the utility of a constant fall.

The work of climbing is arduous and dangerous, and the owner of trees usually lets them out, at a rental which is sometimes fixed for the grove of a large number of trees, and sometimes fixed by the number of productive trees, the rent in the latter case being usually one viss of palm-sugar per climbed tree, whether male or female. Occasionally, half a viss is the rent taken for a male against one viss for a female tree. The occupation of climbing is often subsidiary to agriculture. The average gross value of the produce of a climbed tree was estimated at Settlement to be, according to the tract, from Rs. 1·75 to Rs. 1·40, and the nett value (*i.e.*, the gross value less the cost of cultivation) from Rs. 1·35 to Re. 1·00.

The following account of the economic aspects of *borassus flabelliformis* is based on a note recorded by Maung Po Myin, Assistant Settlement Officer. It relates particularly to the method of cultivation and the incidents of growth of the tree in the region between the Yamas, where the palm-sugar industry is most extensively followed:—

The male and female tree cannot be distinguished until the fruit—if it is a female tree, or the shoot—if it is a male tree—has made its appearance, that is, in the case of trees of either sex, if planted in good soil in fifteen to twenty years, if planted in inferior soil, in twenty-five to thirty years. Sap can be extracted only when the fruit or the spicule has appeared. The period during which a tree can be 'tapped' extends from one hundred years to a maximum of one hundred and twenty-five years. Even then sap could be extracted, for the tree continues to bear fruit and spicules, but the great height of the tree renders climbing dangerous.

The many uses to which the tree can be put are noticed in the Sagaing Settlement Report. The chief use is the production of palm-sugar. Fuel for the season's work is collected in November and, roughly, each tree takes a cart-load. A cart-load of the bark of the *thitya* tree (*shorea obtusa*) is also collected, to be placed in the pots for the purpose of checking fermentation. The bark used by the climbers in this locality is collected in the jungles north of the North Yama. The short and long ladders, *yinzwè* and *yindaung*, are then constructed. The *yindaung* is a long, narrow ladder of bamboo, which is carried from tree to tree; the *yinzwè* is a short ladder, used for mounting to the top of the tree from the end of the *yindaung*, and tied to the tree once for all. If the *yindaung* is long enough to reach to the

top of the male tree, a *yinzwè* is not required. But the *yinzwè* is required for all female trees, as the branches bearing the clusters of fruit hang down, and the *yinzwè* affords a support for the feet of the climber, when operating on them. The *galoing* is a sort of boatswain's chair, tied to the branches to afford a seat to the climber. The other implements are :—

A *htan-hli dha*, or slicing knife.

A *hta-dwin dha*, a knife used for cutting the stalks and the reticulated parts covering them.

A *bu-do dha*, a knife used for cutting away the rough bark from the branches in the preliminary stages of the work. This knife is never used for female trees.

A *hta-du*, a short, crooked, iron bar, in shape not unlike a bent spanner, used for clearing the interstices of the stem between the clusters of fruit, and for bruising the stalk and fruit.

A *dha-hni-ein*, a wooden scabbard for the knife.

A *thanbat*, the iron rim round the scabbard.

A *than-gyeik*, or iron hook, connected by means of an iron ring to the rim, on which are hung the small collecting-pots when the climber is mounting the tree.

The kinds of pot used are :—

The *myu-o*, an earthen pot with a capacity of a quart or thereabouts, which is suspended from the branch to collect the sap.

The *ywet-o*, an earthen pot large enough to hold the contents of several collecting-pots. It is used to convey the sap from the tree to the oven.

The *o-ma-gyi*, a large jar used as a receptacle for the contents of the *ywet-o*.

The *chet-hpyin-o*, the jar in which the sap is boiled on the fire.

The other appurtenances are ropes for the pots and ladders.

The process of extracting and converting the sap is as follows :—

(*a*) Male trees—first season : *tabo-nu-yit*—binding the branches when tender.

The first stage is to clear away unnecessary branches, *htabo-hnwe*, so that only young and tender branches remain. Some of these are split lengthwise with the knife, and are

then bound up. After an interval of three days, about three-fourths of the bound branches are sliced off at the end in the morning, and again in the afternoon, for two or three days in succession, by which time the sap has begun to ooze out. Slicing is continued daily, morning and evening, and collecting-pots are suspended, one on each branch. Generally five to six pots are suspended on each tree. At the outset, pots are usually tied up in the evening and not in the morning. The pot is covered with reticulated fibre to protect the sap from crows. Before the hanging process begins, the collecting-pots, if quite new, are soaked in water, so as to prevent transudation. If the pots are old, they are first washed in water, then placed, with mouths facing, in parallel rows at a distance of one span; dry leaves of the palm are placed in the space between and set on fire. This is done in order to remove from the pots all traces of last year's sap, and it is said that no other kind of fuel will effect this or cleanse the pots properly, and in an uncleansed pot the new sap turns bad, and the palm-sugar will be of poor quality.

After the collecting-pots have been cleansed in this way, about two ticals* weight of chips of the bark of the *thitya* are placed in each pot to retard fermentation. If the tree is a female tree, it is usual to mix a little lime with the bark. The climber never conveys the collecting-pots to the oven himself. His children perform this duty or, if he has none, a hired servant is engaged and paid one-and-a-half to two rupees *per mensem*; in addition to which he is permitted to drink *ad libitum* of the unfermented sap, and to consume as much of the sugar as he wants, and he also receives his meals. The contents of the collecting-pots are poured into the receiving-pot (*ywet-o*), which is emptied at the ovens into the large supplying-pot.

This season of working begins at the end of March and lasts for about fifteen days. The daily yield of palm-sugar from one tree is about fifteen ticals' weight, and the total produce comes to some three viss—between ten and eleven pounds—for the season.

Should there be rain after completion of the preparatory processes, the branches often rot. They are also subject to damage from squirrels and insects, particularly a kind of black beetle with wings which, after biting away the rough parts, eats the delicate portions inside. This insect is said to be about the size of the tip of a finger. There is also a

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* 100 ticals = 1 viss or 3·65 lbs.

white insect which attacks the branches in rainy and cloudy weather.

The boiling work is left to the women of the climber's family. The process commences with the preparation of a range of six or seven ovens, dug in a line on the ground. The sap from the supplying-pot is ladled out in a collecting-pot and poured into the boiling-pots placed ready over the ovens. At the commencement, the first three pots are filled up nearly to the brim, while the last three are only half filled. The first pot is styled the *chwe-o* or *hpo-u-o*; the next, *cha-o* or *hmwe-o*; and the rest, *su-o*. The attendant remains at the side of the range of ovens and it is her duty to transfer, with a ladle often made out of a cocoanut, the boiling sap from one pot to another. Powdered castor-oil seeds are pasted round the brim of the pots inside, a device which ensures the contents from boiling over, for the bubbles subside when they touch this preparation. When the liquid has become very thick the pot is removed from the oven, and its contents are taken out in a wooden dipper and placed upon a tray or in a shallow basket, made into small balls, and left for some time to cool and dry. Rice powder is sprinkled over the balls of sugar to prevent them from sticking to the tray.

The sap collected at all seasons is boiled down to sugar in the same way.

(*b*) Male trees—second season: *hta-bo hnyat*—compressing the matured branches.

In the *hta-bo-nu-yit* season the main stem was protected from breaking, and left uncut. Each of these branches in the *hnyat* season is tightly pressed between sticks of wood or bamboo placed crosswise, in order that it may become soft. Each branch is marked off into two parts, and each part is tied in four places and two pots are suspended, one from each part. Three days after the branches have been tied in this manner, the ends are sliced off evenly in the morning. If, after the squeezing process, no flow follows, the wooden nippers are cut off and thrown away, the reason given being that, if they are thrown away instead of being left on the tree, other climbers will not know that there has been a failure. The process of compression appears to be a delicate one, and failure may result from over or under-pressure. If the trees remain unworked for a day, the yield of sap falls for the next two or three days, and if the trees remain unworked for two or three days at a time, the flow fails altogether. The *hnyat* season begins at the middle of April and lasts for about a month. The yield for the

whole season is about four-and-a-half viss—some sixteen pounds—of sugar.

(*c*) Female trees—first season: *tama-yaung*—extraction when the fruit is tender.

The season begins when the fruits begin to form and swell (*yaung*). The first stage is the employment of the hammer to bruise, to softness the interstices of stalk between the clusters of fruit. The degree of softness is tested by the climber holding with one hand the main part of the branch and with the other the extremity and shaking the branch to and fro, in order to ascertain whether it has been sufficiently beaten. If it has been, after an interval of three days, the short ladder is tied along the trunk, from the termination of the long ladder,* and about two inches are cut from the ends of the branch; and in the evening collecting-pots are hung up. On the following morning, the ends of the cut branches are again thinly sliced, never more than three or four slices being removed. The branches that remain unsliced are left to be worked during the following season (*thiyin*—*vide infra*). The yield of sap will not increase, even if all the branches are operated on. As with the process of squeezing the branch of the male tree, so in bruising the stalk of the female tree the degree to which the operation should be carried calls for a nice judgment or there will be a complete failure of the flow. But if failure results from insufficient bruising, the branch bears fruit and is therefore not cut and thrown away. On the other hand, if the failure results from excessive bruising, the branch dries up and will bear no fruit, and in such a case it is cut and discarded. If no climbing is done for three days at a time, the flow ceases and working must be abandoned. The season begins at the same time as the squeezing of the male tree, both operations are carried on together, and the yield from both is converted into sugar at one boiling. Extraction from the female tree goes on, however, up to the end of May: its duration therefore is about a month and a half. The average yield of a tree *per diem* is the contents of one collecting-pot, from which twenty ticals of sugar can be manufactured. At this rate nine viss in all—or thirty-three pounds—can be obtained in the whole season.

(*d*) Female trees—second season: *tama thiyin*—extraction when the fruit is mature.

The climber mounts the short ladder and, supporting himself against it, beats the branch with its clusters of fruit against the tree. If the bunch is a large one, he will beat

it as many as two hundred times, and the least number of times a small bunch is beaten is fifty. After an interval of three days, the climber mounts the tree, removes two or three of the fruits from the extremity of the bunch and slices about two inches off the fruit-stem. The process of beating is generally repeated ; and when successive slicings have removed all the exposed portion of the stem, another cluster of fruits is removed and the newly exposed portion is sliced in the same manner. The interval between beatings does not exceed three days when the days are bright, but, if there is cloudy weather, the beating is postponed until the weather becomes fair. A long interval between beating does not spoil the working. The yield is collected every morning and evening. If the bunches are beaten against the tree too violently, the fruit falls off. On the other hand, if the bunch is beaten too little, sap will not flow. If climbing is neglected for two successive days the flow ceases altogether. The clusters of fruit are never beaten during rainy or cloudy weather, but only on sunny days. The season commences towards the end of June but may be delayed as long as one month beyond that ; it lasts for two-and-a-half months. The yield of sugar from a tree in a season is six viss or twenty-two pounds

The following generalizations may be noted :—

The flow is in all trees inconstant.

A tree in the prime of life produces more than an older tree.

A tree growing on good soil yields more than one growing on inferior soil.

Trees on low-lying ground yield more than those on rising ground.

The flow is greater in a year of favourable rainfall than in a year of drought.

Male trees yield more than female trees.*

The flow is better on a cool rainy day than in a day of sunshine, but is thinner and produces less sugar.

A south wind reduces the flow, whilst a north wind increases it.

The sap flows more freely in the coolness of morning than in the coolness of night.

A man can climb twenty-five lofty trees in an old and forty trees in a young grove.

The processes followed in the *tari* areas east of the Chindwin are substantially the same as in the description above.

* *i.e.*, The daily flow. But the season is longer for the female tree.

The liability of cultivated lands to damage from floods is slight. The seedlings in inundated embanked land, if very low-lying, are liable to be drowned by a late rise in the river, and the lowest-lying of the hot-weather rice fields are subject to the same risk, but from an early rise. On the whole, the loss is greater when the rivers fail to rise to the usual height than when they exceed it. Along the banks of the small streams, an early-sown dry-crop may be destroyed by flood, but the loss is invariably repaired by a second sowing, of the same or some other crop, according to the time at which the loss takes place. **Damage from floods.**

In general, the cultivator knows nothing of insect pests. and takes no steps to protect the crop from them. The following pests have been reported :— **Insect pests**

(1) The larva of the cockchafer, *podi-gaung*, which attacks the roots of sesamum, red-bean, groundnut and millet. Of all the pests, this is the one which does most obvious damage. The popular belief is that it does less harm in a wet season, and that rain at intervals of ten days will drive it away. Some cultivators sprinkle ashes on the field as a remedy; others scatter, at night, some seeds of cooked rice taken from a house where there has been a funeral.

(2) The Til Sphinx caterpillar, ***nga-hmyaung-daung***, eats the beans and roots of the red-bean, and is also a pest of the rice plant.

(3) An insect known as the *kyet-hle*, probably the white borer of cane, attacks the shoots of the millet plant, and also does damage to beans and tobacco.

(4) The *wabo-ni*, the red cotton bug, is common, but is generally considered harmless, for the cultivators have as often as not never noticed the insect's sucking-beak.

(5) The cotton-leaf roller, ***nyaunglein*** or ***ywettôk***, occurs and is recognized as a pest.

(6) The white ant attacks the roots of gram and groundnut.

(7) The ***hpalanbyu*** attacks the rice plant. The insect has not been identified generally, but the name is applied in the west of the district to a species of grasshopper.

(8) Crickets damage the plants of sesamum and red-bean.

(9) Various kinds of caterpillar attack several field crops.

(10) The stored grain of millet, and no doubt other grain also, suffers from the rice weevil, against which no special precautions are taken.

(11) The Rhinoceros beetle is found, but no damage has been reported.

(12) Other insects, which have not been identified, are known by the name of the part of the plant which they attack: such are the *sitpo*, the joint-pest—possibly the rice-stem fly or the wheat-stem borer. The larva is reported to be slender, yellowish in colour, with a brown head, and to be half an inch long. The stem of the plant falls over, after attack; and the *mvitpo*, the root-pest of the rice plant, and of wheat and onions.

(13) The *p'daung-de*, described as a small, brown, hairy insect, attacks the shoots of rice and millet.

(14) An unidentified pest of the millet plant is known as the *chaing*; and of the betel-vine, the *suppya* insect.

Damage is also ascribed to insects which have never been seen and to which fanciful names are given, *e.g.*, *ataungbi*, *pya*, supposed pests of sesamum; in the same way, the *ywetchauk-po*, the insect which causes the sesamum leaves to wither, has no ascertained existence.

Other pests. The greater pests are also found and, as they are more obvious, some steps are taken against them. Parrots and other birds raid the ripening ears of grain, and the diligent cultivator will fill his fields with scarecrows, ingeniously shaping out of a leaf of the palm tree a passable representation of a hawk on the wing, tying it to a bamboo, and leaving the wind to stir it to a semblance of life; or will sew some rags together into the shape of a man, or paint a gourd into a grotesque simulacrum, or make and stuff a complete doll, limbs and all, and fix it up in the field or in a tree near by. The millet crop—except where, as in the black-soil areas, all the country is so closely cultivated that there is no forest growth at hand to afford shelter to the birds—is particularly liable to depredation, and it is the usual custom to erect a lofty stand in the middle of the field, on which the children of the family are stationed, to frighten the birds away. Sometimes the defensive measure takes the shape of a bow discharging clay pellets, sometimes the pellets are discharged from a sling, sometimes a clapper is used, sometimes the platform is connected with every part of the field by means of radiating lines, fixed on to uprights and armed with palm fronds. The watcher notices in what part of the field the birds are contemplating a descent, takes up the strategic line, shakes it vigorously, and the agitation communicated to the palm fronds may scare away the marauders. They are, however, bold, and probably drop again a few yards away.

Crows do damage, especially to the groundnut crop, of which they eat the young sprouts, besides attacking the newly formed pods. Pig and barking deer raid the crops in the tracts under the hills on the north and west, and the sesamum crop east of the Chindwin suffers from the brow-antlered deer and—occasionally—the hog-deer. Along the east of the district, from the Upper Chindwin border to the cotton country and through the centre of that region past Kyaukka to the Sagaing border, elephants are an annual menace to the crops. Guns and ammunition cannot be carried except by licensed holders, and an elephant, unless charging, cannot be shot except with the special sanction of the Commissioner of the Division. The damage to the crops is therefore generally done with impunity Scientific hedging, to protect the crop against the smaller marauders, is unknown. Hedges are formed of the thorny branches of the *zi* (jujube, *zizyphus jujuba*) and serve to keep out cattle, but ground game and pig make light of them. In the black-soil tracts—where cultivation is close, the jungle distant, and serious depredation from wild animals less—long stretches of cultivation occur without hedges

Weeds. The destructive weeds are numerous, but have not been examined. The most harmful is considered to be the *pwinbyu*, a small weed with a white flower, which springs up in millet fields. The popular belief that the weed kills the millet is probably erroneous; the weed no doubt springs up in an exhausted soil, in which millet has been grown for too many years in succession, and the remedy is a rotation crop. It is occasionally stated that *pwinbyu*, whilst it strangles or blasts* red millet—both forms of damage are imputed—does not hurt white millet. Other weeds harmful to millet are *myat-le-ni*, *yônpadi*, *gyosa-kauk*, *gyat*, *ya-kazun*, probably the same as the *taung-kazun* or *bizat-kamet*, and *nga-yan-balu*. They have not been identified.

Other destructive weeds are :—to rice: *tagunbyu* (white streamer), possibly merely descriptive of the appearance of a rice plant attacked by the rice *hispa*; in a dry year, *nga-tha-yaung* and *wunbèsa* grass; in a wet year, the weed *namathi*, and *yedama*, a green scum which forms in a rice field; to sesamum, in a wet year, *bizat*; to crops in general: *shwe-za-naing* or *wet-gyi-panè*, and *buttani*. None of these weeds has been identified except *wunbèsa*, which is *panicum crus galli*.

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* An alternative name is *thagya laung-mi*, fairy-scald.

Saline efflorescence.

The people are aware that the efflorescence rises more in a year of hot sun and that, if there is sufficient water, the harmful elements pass away in solution. No measures are taken designedly to retard surface evaporation, for instance by fencing or growing special crops, but in some places the application of horse-dung or millet bran is believed to be beneficial. The probable effect of the artesian well irrigation round Powindaung has been noticed in Chapter I.

Cattle.

Before annexation, years of misgovernment had encouraged cattle-theft and restricted grazing, and the stock of cattle was small. It has increased more than fourfold in the last twenty years, *vide* the figures given in Chapter III. The figure recorded for 1906-07 differs by a small amount only from the headmen's figure reported to the Deputy Commissioner, and as the enumeration by the Settlement was conducted on different lines, may be accepted as substantially correct. The district has been free from devastating cattle-disease for a decade and, although it cannot be expected that serious outbreaks will not recur, there is support in the statistics for the conclusion that the precautionary measures enforced in the villages have been accompanied by success. There are three Burmese veterinary assistants on the staff of the district office; their chief duty lies in the prevention and treatment of outbreaks of cattle-disease.

There are few parts of the district where the conditions required by the water-loving buffalo prevail, and the number of buffaloes, 11,328, is small.

The stock of cattle was enumerated as follows in 1906-07:—

Plough-cattle : buffaloes	... ...	6,211
Bulls and bullocks	... ...	85,498
Other than plough-cattle : buffaloes	... ...	4,357
Bulls, bullocks and cows	...	162,191
Total	...	258,257

The stock of plough-cattle divided into the matured acreage of that year—435,533 acres—gave an average per pair of plough-cattle of 9·48 acres. In addition to the area of matured crop, the cattle are called upon to plough the area which has been sown but on which crops have failed to mature—this may be estimated at 10 per cent. of the matured area—and about 11,000 acres of land which is twice cropped. Correcting the figure of average area

accordingly, it may be estimated that each pair of plough-cattle is called upon to plough about eleven acres, an area which it can easily manage. As a matter of fact, the district exports plough-cattle. The district does not breed goats, of which only 834 were enumerated in 1906-07. In that year there were counted 2,579 horses of all sorts.

Grazing and breeding.

No care is paid to the breeding of cattle. The young stock—bulls and cows—graze together until, at the age of four or five, the bulls undergo the operation of castration. Practically all bulls are castrated, since they would not otherwise be docile in the plough.

There are few places in the district where the plough-cattle do not require to be stall-fed at some period of the year and, when grazing is not available or the animals are in hard work, they are stall-fed with chopped millet-stalk, rice-straw, millet bran, the sliced fruit of the *tari* palm, and oil-cake. Usually all the cattle are kept out as long as the grazing in the neighbourhood of the village lasts. After that, the plough-cattle are stall-fed, besides being grazed. In addition to the species of fodder already noticed, many kinds of bean-bines are fed to the plough-cattle, but certain sorts are rejected, namely, the bine of the Soy bean, *pe-nga-pi*, of *pelun*, a late bean; and of gram, which is said to cause emaciation. Maize stalks are also used as fodder and, when cultivated fodder fails, the leaves of several kinds of jungle trees are cut and fed to the cattle. The stall-feeding available from the produce of the holding, when insufficient, is supplemented by purchase, invariably of millet stalk and frequently of sesamum oil-cake. Special fodder crops are very little grown, but in the silt tract maize is mixed thinly with red bean, and cut green for fodder, and an occasional fodder crop of millet, sown thickly and left unthinned in order to grow to stalk, is met with.

The plough-bullocks are generally good, sturdy beasts, and in the silt tract south of Mônywa, where a proper plough is used and a strong animal is required, are exceptionally well made. No use is made of the milk of the cow, whether in its simple form, or as butter or clarified butter, and no care is bestowed on the cows. They, with the young stock, remain in the byre, often standing or lying knee-deep in slush, until the family have finished the morning meal, when they are driven out to pasture. Cows are grazed only. They are not stalled nor stall-fed, except in the inundated tract. They are usually weedy in build, and it is surprising that the plough-bullocks bred from them are as strong as they are.

The height of a four-year-old plough-bullock is generally said to be two cubits and a span, but taller animals are found in those parts of the district where the plough is used. Material upon which to base an opinion whether the breed has improved or not since annexation is lacking, but, as there has been no change in the methods of breeding and tending, there has probably been none in the build of the animals. The weight of the harrow used in cultivation is the same now as it was in Burmese times. The few professional graziers are natives of India, very often pensioners from the Military Police Battalion Some have settled in the villages along the Mu. They sell their young stock, which they do not stall-feed, and their herds have not, up to the present, acquired the notoriety for disease which usually accompanies the native-of-India grazier.

Cultivation has extended into the waste and with the increase in stock and the pushing out of forest reserves, grazing difficulties are arising. Fortunately, the face of the country is so diverse that there is usually grazing available at distances which are not prohibitive. South of Mônywa, the riverine tract of country is subject to inundation from July to October, and is thereafter under close cultivation, and there is no stubble. In a year of good inundation the village site, like the cultivation, is flooded. The cattle stall has therefore to be raised to a height of a few fe t with earth There is no breeding in this tract, few cows are kept, and such as are must be stall-fed. The herds from the adjoining tract on the east are driven to graze on the slopes of Kyaukka, about ten miles to the east, when they are not stall-fed, and there are properly fenced cattle-paths leading through the cultivation up to the foot-hills. On the west of the Chindwin, the black-soil plain mentioned in preceding paragraphs is under close cultivation, and there is little grazing available, between July and December. Herds are driven east to the uplands south of Salingyi or south across the South Yama to the slopes of the Myaing hill range in Pakôkku district. The grazing fee in this region is one basket of red millet for each head of cattle for the grazing season. Elsewhere, an ordinary custom is for the herd and the owner to divide the natural increase, the herd taking, as his share, young stock equal in value to one-half of the whole natural increase whilst the herd has been in his charge.

There are no reserved grazing-grounds in the district, but the jungles, all the year round, and the cultivation, when crops are off the ground, are open to any one's cattle.

Irrigation.

There is no Government irrigation in the district, and all irrigation works are constructed, maintained, and managed by the people themselves. Of such petty irrigation works, taking the shape of dams of earth entirely blocking up the stream bed—a type of work found in the black soil tracts, where the streams run in well-defined, narrow, fairly deep beds—or of sand training-banks, pushed out to a varying length across the channel, a type found in the red soil tracts, where the torrents run in wide, ill-defined, shifting beds between low banks, 348 were counted in the year of Settlement, and this figure excluded some small systems from which less than three holdings benefited. These are the chief types of irrigation work, but there are variations: sometimes the dam, instead of being constructed of earth alone, is made of alternate courses of roughly-hewn stone and earth, and the interstices are packed with rice-straw. Sometimes the dam is a dike of large stones thrown roughly together: in one case the water is diverted by means of a *barège* of logs placed one upon another and packed with brushwood. Sometimes the dam is strengthened at the canal head by means of bamboos driven down vertically. In some cases, at the toe of the embankment on the upstream side a row of stakes is driven into the ground, with the primary object of collecting the drift wood brought down when the stream comes into flood, and the ultimate object of forming a breakwater. Rude aqueducts, constructed of the hollowed-out trunks of trees, are met with in many systems, where a depression or stream bed interrupts the commanded area. Custom, the nature of the channel, and the degree of control the village headman or other official in charge of the work can bring to bear modify the form a particular work takes. Nearly all the works are on the west of the Chindwin, and this is attributable partly to the fact that the rainfall is greater there than on the east, and irrigation would naturally be attended with more success, and partly also to the fact that that part of the district is remote from a railway and cut off by the Chindwin, has felt the disintegrating effect of civilization less, and the village headmen have greater authority with the people. The conditions favouring irrigation are not materially different along the Inbaung and the Yewa streams, yet along the former stream there were in 1906-07 only two systems, whilst along the latter there were more than one hundred, most of them constructed by the Kani landlords. Types.

The Burma Canals Act, recently enacted, contains provisions which will enable the manager of a small irrigation work to assemble the beneficiaries, where the old custom was for all to join in putting up a dam or unsilting a channel.

Irrigation customs. In many of the western systems the beneficiaries sign a bond—annually or once for all—stating that they will help in the work or find substitutes, or, in the alternative, submit to a fine from which the manager of the work can engage labour. Along the Hmyaing stream, which flows into the Chindwin north of Kani, the numerous small systems are grouped into an upper, a middle, and a lower block, and each block takes water in turn. With this exception, there is no stream on which the rights of upstream and downstream systems are in any way regulated, and the same applies to right-bank and left-bank systems. Every system pushes out its training-bank as far across the stream as it wishes, to a height which suits its convenience, and when it likes. No downstream system can object, nor can the people on the other bank interfere.

Within the system, customs are surprisingly diverse. For instance, labour is rostered in some systems *per capita*: each beneficiary is liable for an equal amount of work, whether his protected area is large or small, near the water-supply or distant from it. In other systems, whilst all equally help in erecting the weir, only the nearest fields are required to turn out for current repairs. The distant fields are exempt. In others, again, the number of labour units leviable from the beneficiaries varies according to the area of the particular holding. In most, the area unit is a certain number of bundles of rice seedlings, *e.g.*, a man whose fields take 1,500 bundles supplies one labour unit; the man who plants 750 bundles, half a unit, and so on. But here, again, local custom varies. In the estimation of the labour unit it is the usual, as it is the logical, custom to regard water-supply only. No one can claim reduction in his labour unit because of any soil defect. Here, again, an occasional exception is found which allows soil quality to be considered when estimating the area to be counted as one unit. The roster having been made, the tasks are divided, usually in twelve cubit lengths, and are allotted by the weir official, and subsequent calls for labour are assigned *pro rata*, subject to the special exemptions allowed by the custom of the system. The calculation of the amount of labour due appears to be accurate. Occasionally, the distant fields, doubting whether any weir water will reach them at all, refuse to turn out on the works. In such a case, the

custom is for the fields, if they do get water, to pay the weir officials so much for every hundred bundles of seedlings planted.

From the weir-head, a main canal leads to the block of cultivation, and there, or in some cases earlier, divides into main distributaries, each of which, at a convenient place, branches out into subsidiary ducts. The distributaries and ducts are led along favourable contours of the ground, the aim being to make the fall as gentle as possible. The division of water between the chief distributaries is a matter of immemorial local custom. Sometimes one distributary will take all the day water, and another all the night water; sometimes each takes a whole day; sometimes one is allowed to 'drink' only after the other has taken all that its fields require. So along each distributary: there is often a series of small stopdams which divert the flow to successive blocks of fields; the distribution between the blocks is fixed by custom, and is closely watched. The fields with the first claim are almost invariably those which are near the weir-head and to which the water would flow of itself by gravitation: the high-lying fields above the upper course of the main distributary almost always have the last claim to water.

With regard to the distribution of water between interior fields, which do not lie along any distributary, major or minor, local custom varies: in some systems the officials disclaim all responsibility for the water-supply of these fields, and admit liability only for fields lying along distributaries constructed by the common effort. In such a case, the cultivator of the upper of two interior fields not on the same level controls the lower field embankment. In other systems, the weir official controls the water-supply of interior fields as well as of fields along a distributary. It is with regard to these interior fields that water disputes arise.

The weir officials are, in a large system, the *kanôk*, weir manager, who controls the arrangements generally: a varying number of *kandaings*, each responsible for the due completion of a section of the work and for the distribution of water to the fields in the section: and a *kansaw*, who acts as messenger in the issue of orders, calls for labour, and the like. Smaller systems work with a *kanôk* only, and the appellations are not always these. Election of the weir officials is the rule, and the electors are all the beneficiaries, who have each one vote; the appointment is subject to revision at any time, should the beneficiaries think that the allocation of work or water has been improper. But most elected

officials serve on for many years, and water disputes are rare. In some few systems the weir official is hereditary, but in that case, too, he holds office subject to approval. Remuneration in cash or kind is rare, but the officials, each in his degree, are exempt in whole or part from labour on the works.

The Pyaungbya weir. The principal irrigation work in the district is the Pyaungbya weir. The headworks are at Sadawbyin, a few miles west of Yinmabin. They consist of a training bank in the North Yama stream, approaching a length of three-quarters of a mile and constructed of alternate layers of sand and rice-straw, and of several distributing channels. The irrigable area exceeds two square miles.

Traces of Shan influence. It is noteworthy that in the parts of the district where village irrigation is most successful, along the Yamas, there is a history of Shan colonization, and it is possible that the Shans introduced simple methods of irrigation.*

Saline-water irrigation. The salt stream which flows south-west from the marsh near Yedwet has been mentioned in Chapter I. Its waters are diverted by small training-banks.

Artesian well irrigation and irrigation from springs. Around Powindaung hill, south of the North Yama stream, there is a peculiar variety of irrigation, which has been noticed in Chapter I. Hollow bamboos are driven through the surface soil to a maximum depth of twenty feet or so. If a spring is struck, the water rises in the bamboo, the soil round the mouth of the bamboo is removed so as to form a cup to receive the outflow, one side of the cup thus formed is broken down, and a duct made to convey the water to the cultivated fields. Often several of these tiny ducts converge into a larger distributary which conveys water to the distance of a mile or more. Seven hundred and three of these artesian springs were counted in the year of Settlement, 1906-07.

In the same part of the district and near Taya, a few miles from the South Yama, occur areas irrigated from natural surface springs. The number of springs giving water in the Settlement year was forty.

The same jealousy of water-rights appears in these pipe- and spring-irrigated areas, and an even greater diversity in the plans for regulating the division of water. In some systems the water-right attaches to the compact holding comprising many fields, and the cultivator may let in the water to any field he pleases: in others to the particular field, and the cultivator must either lead the water on to

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* *Vide* Gazetteer of Upper Burma, Part I, Volume, I, page 275.

that field or let it go by altogether. The reason given is that if a cultivator were once allowed to select a fresh field on which to use his limited supply he might next year claim water for both fields, on the ground that both fields had received water in the past. Water-rights go with the field or holding on transfer of the latter, and cannot be disposed of apart from the field. As a corollary to the possession of the water-right, the holder of that right claims, and has had from time immemorial, possession of the water-bearing waste land from which his spring flows, or in which his well has been bored. No one else can enter this area to make a fresh boring.

Division of water between the small distributaries is in some of these systems secured by the custom of *dôndit*,—literally, notching a log. A log is placed across the main stream at the junction, in such a way as to close the flow entirely, and two sections, of the same depth but of varying width, are cut out of the upper surface of the log, so as to allow the water to flow over to each distributary. Whatever water the stream bears enters the particular distributary in proportion to the width of the section, and the width is fixed in accordance with the extent of the water-right. This ingenious device gives to each distributary its proper share always: the more common plan of closing entirely each distributary in turn leads to inequalities when, on the open day, there is a more than ordinarily abundant or scanty flow in the stream. Another device is to place the cylindrical section of a hollowed tree trunk in the bed of each distributary at the junction. These sections are packed on each side with earth, so as to confine all the flow to the section of trunk. The water which each distributary receives is by this means regulated to the capacity of the section, and if sections of equal diameter are chosen the supply will be equal.

Unambitious as are the small irrigation works described above, they are of great practical importance and value. The rainfall is local; one village may get a heavy downpour, whilst, a mile off, the next village get nothing. The petty irrigation system, which adds to the local rainfall the rainfall of the adjoining village, ensures a rice crop where—without it—there would have been, at the best, uncertainty and, at the worst, the certainty of no crop. In a bad year, when a large proportion of the rice fields which depend on the rain from heaven fails, the majority of the fields irrigated from these small systems succeed, whilst in a good year, when all the rice fields secure a crop, the

irrigated fields receive a greater supply of water and yield more abundantly.

Lift irrigation: wells. Along the Yamas there is a good deal of irrigation of valuable garden crops, onions, tomatoes, brinjals and tobacco, from impermanent wells. They are from six to twelve feet in depth, and are lined with a wattle of bamboos for six feet or so from the bottom. The water is drawn out by means of the bucket and lever. The cost of digging and wattling such a well does not exceed four rupees, and after the well has been in use for two years it is usually abandoned and a new well dug at another corner of the field. The number of impermanent wells giving water in the Settlement year in this part of the district was 716. There are no masonry irrigation wells in the district.

Other modes. Hot-weather rice is irrigated by means of the trough lift (*ku*) and the swing basket (*kanwè*). Very rarely, inundated rice land is similarly irrigated, and, along the South Yama, onion beds are occasionally irrigated by means of the trough lift—*vide supra*. The *yit*, or water-wheel, is hardly known, but one or two are found along the Chindwin in the south-west of the district. and are used for irrigating nurseries of late rice Near Nyaungbyubin, south of Mônywa, the water for the fields of hot-weather rice is drawn from wells, sometimes as deep as eighteen feet, by means of the bucket and lever.

Tanks. There are numerous small tanks, or pools, but no large one. The largest, covering thirty-six acres, is at Thindigan, south-west of Yinmabin. Usually the water-area does not exceed two or three acres and suffices to irrigate a few rice fields. Nearly all dry up in the hot weather, but cultivation is rarely carried on in their beds.

Possible irrigation works. New projects of irrigation on a large scale appear to be impracticable. The Chindwin river below Mônywa overflows, chiefly through an inundation channel which discharges most of its waters into the north-western corner of Sagaing district, where it floods a considerable area. If this channel fills in October after a late rise in the Chindwin, the inundation water drowns much that has been sown, and delays fresh sowings. The practicability of excluding the late flood, by a series of dams or otherwise, is under consideration in the Public Works Department. The difficulty lies in the fact that the water enters by several subsidiary channels, in addition to the main channel, and all would require to be controlled.

Elsewhere, possible sources of irrigation appear to consist of fresh schemes of village irrigation along the course

of the torrents, the creation of small tanks, and the trial of artesian irrigation in new places, for instance near the marsh from which flows the Yèdwet stream. No official scheme of irrigation embraces any part of the district, so far as is known.

CHAPTER V.—Forests and Minerals.

[The Forests section compiled from material supplied by Mr. A. E. Ross, Imperial Forest Service, Deputy Conservator of Forests, Lower Chindwin Forest Division.]

Forests.

Boundaries and drainage of the Lower Chindwin Forest Division.

As at present constituted, the Lower Chindwin Forest Division is drained by three main rivers: the Chindwin, the Irrawaddy, and the Mu. The Forest Division is not coincident with the Civil district, but is situated partly in the Lower Chindwin and partly in Shwebo districts. The boundary between the districts in the north-east is an artificial line, whereas the boundary of the Forest Division follows the watershed between the Chindwin and Mu rivers thus including within the Forest Division a portion of the Shwebo district.

In the east the Division boundary follows the district boundary along the Mu to the Sagaing border; thence runs west to the Chindwin along that boundary, to a point opposite Paungwa; thence down the Chindwin to the mouth of the South Yama; thence along the South Yama westwards to the Shwetagyi spur, at the southern end of the Pagyi hill range. From that point, instead of following the watershed between the Chindwin and Irrawaddy rivers, the boundary runs southwards along the Shwetagyi for seven miles, and then due west to the Pôndaung, cutting across the Letpan and Kiné streams, which are tributaries of the Kyaw river, itself a tributary of the Irrawaddy flowing south. Thence it follows the Pôndaung northwards to a point approximately west of the Alaungdaw; thence a cross ridge running in a westerly direction to the Pônnya range; thence it runs north for a few miles along the Pônnya; thence east again to the Pôndaung, encircling the Petpa stream drainage: thence north to a point at the head-waters of the North Thitkauk stream, south-west of the Sè ywa glen, from which point it proceeds in a north-easterly direction along the Upper and Lower Chindwin district border, across the

Patolôn river and along the Shwethamin ridge, to the junction of this ridge with the Mahudaung. Thence it runs northwards for some twelve miles, as far as the point at which the district boundary turns east; thence the district boundary is followed to the Chindwin, east of which river the Division boundary follows a ridge in a north-easterly direction as far as the Mu-Chindwin watershed.

Physical features. The Pôndaung, which rises to a height of a little over 4,300 feet north-west of Mayin village, is a long, precipitous ridge, running north and south and separating the Patolôn and North Yama drainages from the Taungdwin and Kyaw streams. Oaks, chestnuts and pines are found near the summit. In the south it drops to a comparatively low ridge, barely 2,000 feet in height. The Mahudaung is a much lower ridge, rising to a little over 2,000 feet and running north and south between the Patolôn stream and the Chindwin. Near its crest on both sides it is usually very steep. It ends to the south in a curious flat-topped hill, Kodaung, due east of Mayin. East of the Mahudaung is a still lower ridge called in different parts the Pindaung, Ngapyôndaung and Pagyi range. The Pôndaung and Mahudaung are joined by the Sameikôn ridge, which forms the watershed between the North Yama and Patolôn streams.

Situation of forest-bearing areas and principal timber-floating streams. The forests to the east of the Chindwin south of Budalin are of little value, except for fuel. Within the Inbaung drainage in the north-east of the district and in the vicinity are the Hnaw forest of Shwebo and the Inbaung and Ôkma below Yin forests of the Lower Chindwin: these, though greatly damaged by reckless felling and burning, still contain valuable *in* (dipterocarpus tuberculatus), *ingyin* (pentacme Siamensis) and *thitya* (shorea obtusa).

To the west of the Chindwin the forests are drained by the following main tributaries of the Chindwin:—The Patolôn, which flows northwards between the Pôndaung and Mahudaung, with its lower reaches in the Myittha Forest Division, and enters the Chindwin a little below Mingin in the Upper Chindwin district; the Thingadôn, flowing northwards along the foot of the eastern slope of the Mahudaung, and entering the Chindwin a little south of Kin; the Yewa, flowing eastwards from the Mahudaung and entering the Chindwin near Kani; the North Yama, which rises near the Sameikkôn cross ridge and flows south between the Mahudaung and Pôndaung ranges until it reaches Wunbè-u, two miles south of Zeiktaung, where it turns due east, finally entering the Chindwin at Kyaukmyet, a little above Mônywa: it is joined a little below Kônywa by the Tinzôn

from the north-west; and the South Yama, which rises in the Shwetagyi spur and flows due east to the Chindwin. Owing to their great breadth and shallowness, the Thingadôn, Yèwa, Tinzôn and South Yama are practically useless for floating logs. Even the North Yama, after cutting through the Pagyi range, spreads over a wide bed and contains little water for the greater part of the year. The Patolôn is a rocky stream of some size, and contains water all the year round, but is not navigable for boats or rafts even in the rains. In all cases, the teak logs are caught on arrival in the Chindwin at or a little below the months of its tributaries.

Geology. The geology of the hills which form the western forest area has been noticed in Chapter I.

History before annexation. The revenue from the Chindwin and Mu forests in 1884, before annexation, was Rs. 1,00,000. This was from all the forests along the two rivers, and the portion assignable to the forests of the present Lower Chindwin Forest Division cannot be stated. Under the Burmese monarchy, teak (*tectona grandis*) was a Royal tree, and no one was allowed to cut it except under a license from the king The people were, however, permitted to use dead and fallen teak in the construction of monasteries and works of public utility, and, if sufficiently influential, sometimes used it for house-building. There were local areas, for instance the eastern slope of the Mahudaung, where extraction by small traders took place, but no one, so far as can be ascertained, worked the teak forests of what is now the Lower Chindwin Division on a large scale except Messrs. the Bombay Burma Trading Corporation, who obtained a license from king Thibaw, in 1880, to work all the teak forests in the Chindwin drainage. The lease was to run for eight years and had therefore not expired at the time of annexation.

After annexation. After annexation it was found that there had been great destruction of good teak forest by fire and, to a certain extent, by the mode of rice cultivation known as *taungya*, which necessitates the burning of tree-growth over large areas in clearings on the hillside. Immature trees had also been girdled and thereby killed, and there had been felling of green teak. It became necessary, therefore, to introduce the Upper Burma Forest Regulation, and this became law in August 1887. Besides teak, five other species were made reserved trees. During the first few years, the country was in a disturbed state, little could be done to enforce forest rules, and the Corporation was permitted to girdle.

On the 18th August 1888, the Corporation obtained a lease of the Chindwin forests until the end of 1900: under this lease all girdling had to be carried out, not by the lessees but by the officials of the Forest Department. This put an end to injudicious girdlings. A minimum annual extraction, under penalty of a fine, formed also one of the stipulations. Until 1891 the forest staff was for the most part engaged in examining unknown tracts for reservation, in making rough surveys, and in carrying out girdlings for the lessees. Changes in the extent of the Division took place in 1892 and 1896, *vide* Revenue *infra*

The Upper Burma Forest Regulation was repealed in 1898, the Burma Forest Act being substituted. In March 1901, the Corporation were granted a new lease of the Chindwin forests, which expires in 1910. Girdlings are now done by the selection method under a fifteen-years' girdling scheme, calculated to yield about 2,500 trees per annum in the Lower Chindwin teak forests

Surveys. All the reserved forests except the Thingadôn Extension have been surveyed on the scale of 4″=1 mile, by No. 20 Party of the Survey of India The area so surveyed is 753 square miles and the cost has been Rs. 1,50,337. The Thingadôn Extension, 29 square miles in area, has recently been surveyed, on the scale of 1½″=1 mile, by No. 3 Party.

Settlement of reserves. The first reserve formed was the Patolôn, of which the boundaries and the rights allowed for the future were notified in 1893. The last formed has been the Thingadôn Extension, gazetted in 1908 The total area of reserved forest is now 782 square miles. Other reservations are contemplated, of areas adjacent to existing reserves on the west, and in the Inbaung and Hnaw regions, east of the Chindwin.

The area of unclassed forest, *i e.*, forest land which has not been reserved and which has not been occupied for purposes of cultivation, is estimated to be 648 square miles. Beside reserves contemplated for revenue purposes, the advisability of reserving other areas in the interests of fuel conservation and rainfall protection is under consideration The areas which might be reserved for these purposes are situated in the southern and eastern parts of the district There are no "protected" or village forests: all the forest land is either *Reserved* or *Unclassed*.

The existing reserves, which form one more-or-less compact block of forest, lie to the west of a well-defined natural line formed by the Thingadôn stream in the north and the Pindaung, Ngapyôndaung and Pagyi ridges in the

south. Their names and areas are shown in the following statement:—

Civil District.	Name of Forest.	Area on 30th June 1908, in square miles.
	Reserved Forests.	
Lower Chindwin	Patolôn Reserve	47
	East Patolôn Reserve ...	240
	Patolôn Extension ...	142
	Thingadôn	23
	Thingadôn Extension ...	29
	Pindaung	55
	North Yama	84
	Sindôn	30
	Satha	39
	Lègan	93
	Total ...	782
	Unclassed Forests.	
Lower Chindwin	Hatti	10
	Didôk	8
	Patolôn	22
	Pindaunggale	73
	Kani	79
	Thingadôn	6
	Inbaung	280
	Budalin	100
Shwebo ...	Hnaw	70
	Total ...	648

The total length of reserve boundaries, artificially demarcated and maintained in repair under a five-years' scheme, is 365 miles. There are 206 miles of natural boundaries, not requiring demarcation other than a boundary post at distant intervals. The total length of exterior reserve boundaries is therefore 571 miles. **Reserve boundaries.**

The total area of reserved forest for which working plans are required is 782 square miles: of this area, 137 square miles, namely, the Thingadôn Reserve, its Extension, the Pindaung, and the Sindôn Reserves, were examined in 1908-09 for the purpose of preparation of a rough working plan; 645 square miles of reserved forest remain to be examined. **Working plans.**

Description of the forests: teak-bearing areas. The most important tree in the reserved forests is teak, and the chief teak forests are found in the Patolôn and North Yama valleys, on the eastern slopes of the Pôndaung and on the western slopes of the Mahudaung. There is a little teak forest on the eastern slope of the Mahudaung, principally at the headwaters of the Thingadôn stream, but all except the very large and most inaccessible trees were felled in Burmese times.

The teak-producing areas contain also *pyinkado* (xylia dolabriformis), *padauk* (pterocarpus macrocarpus), *yemanè* (Gmelina arborea), and many other varieties.

Other than teak. The pine forests on the top of the Pôndaung are so inaccessible that they do not call for detailed description. Though evergreen forest does occur near the crest of the Mahudaung and along some rocky streams, as the Paya stream in the Alaungdaw gorge, the type covers an inconsiderable area. By far the commonest type is *indaing*—the forest of dry, sandy, red soil regions—which merges into dry teak forest, and that again, near streams and in moist localities, as below the Mahudaung crest, into moist teak forest. It is not known how many square miles of each type of forest there are. The common and more valuable species in the *indaing* and dry forests are: *in* (dipterocarpus tuberculatus), *ingyin* (pentacme Siamensis), *thitya* (shorea obtusa), *than* (terminalia Oliveri), *taukkyan* (terminalia tomentosa), *thitsi* (melanorrhœa usitata) and *sha* or cutch (acacia catechu).

In the plains, cutch (acacia catechu), *than* (terminalia Oliveri), *dahat* (tectona Hamiltoniana), *thitpôk* (dalbergia purpurea), *heinnwè* (hiptage candicans), *lein* (terminalia pyrrifolia) and *ngu* (cassia fistula) are common, especially in the fuel tracts in the vicinity of Powindaung and Kyaukka.

The reserves east of the Mahudaung are as a rule very dry, and contain little teak and much *indaing* forest. Though the forests on the western slope of the Mahudaung are mostly of the same type, there is teak near the streams and just below the crest. The richest teak-bearing areas are undoubtedly those situated on the eastern slopes of the Pôndaung, and the most valuable reserves are the Patolôn and the North Yama.

Extraction and trade. Teak. In the Lower Chindwin Division as it now exists, hardly any attempt has been made by local traders to extract teak. Practically the only demand for teak is for the building of monasteries and rest-houses, and up to the present this has been met by the issue of free licenses on a large scale. The tonnage of teak extracted by the Bombay Burma

Corporation and delivered at Pakôkku for the three years ending in 1908-09 was: 1,105, 505, and 1,604. Owing, however, to confusion of the hammer-marks struck on the lessees' teak logs, it is certain that many Lower Chindwin logs have in past years been credited to the Myittha and Yaw Forest Divisions.

In; bamboo: *thitsi*. There is a considerable local trade in *in* (dipterocarpus tuberculatus), which is cut under licenses in the Ôkma and Inbaung forests for export to Lower Burma. *Thitya* (shorea obtusa), *ingyin* (pentacme Siamensis), and *pyinkado* (xylia dolabriformis) are also extracted. The *in* logs extracted are of good quality and very cylindrical, and the trade is profitable. Bamboos are extracted in considerable quantities from the Thingadôn and Hmyaing forests, which are close to the Chindwin on its western bank.

The *thitsi* tree (melanorrhæa usitata) is tapped for the wood oil, or varnish, on an inconsiderable scale; the industry centres in Nyaungbinlè in the north-west and the Hnaw forests on the north-east. Licenses are issued at Rs. 7-8-0 per chisel *per annum*. The method is described at page 779 of Watts' *Commercial Products of India*.

Cutch. Cutch is extensively manufactured in the unreserved areas between the Tinzôn stream, the chief tributary of the North Yama, and the South Yama. No fee is charged for a cutch license, but duty is charged on all cutch exported from Burma. A few years ago cutch trees were marked for felling in the North Yama Reserve, and cutch-boiling under licenses was permitted within the reserve, but the danger from fire and the difficulty of supervision were so great that, on the introduction of the system of free cutch licenses in unreserved areas, it was decided to encourage the working out of cutch from such areas, and, since the free license system came into force no applications to work cutch in reserves have been entertained. In the last two years the average number of cauldrons at work has been 1,425, and the average quantity of cutch exported to Lower Burma has been 543,512 viss or approximately 850 tons. The local method of preparing cutch does not differ materially from that described in *The Commercial Products of India*, page 9.

Communications: Forest roads. There is a five-years' scheme for the construction of forest roads or bridle-paths in the reserves, which is approved by the district authorities and framed in conjunction with the scheme of district roads. So far no roads have been made by the Forest Department over the Pôndaung into Pakôkku district but several roads running from east

to west over the Pindaung and Mahudaung have been made or improved by departmental agency.

Over the Mahudaung.

The most northerly road over the Mahudaung leads from Pahè, near the mouth of the Thingadôn stream, into the northern portion of the Sè-ywa valley. The easiest road is, however, that leading from Myaunggôn, half-way between the mouth and the source of the Thingadôn stream, into the north-east of the glen. This is the road into the Sèywa which might possibly be most easily converted into a cart-road. The track which is at present most used, as it is more central for Kani, is the Yaygi-Kunbinyè-Saingdè road, Yagyi being situated near the head-waters of the Yewa stream, and Saingdè, at the southern end of the Sèywa. The road branches after leaving Kunbinyè on the Mahudaung crest, the other path leading in a north-westerly direction to Tantabin, a village midway up the glen. Another track leads from Nyaungbinlè north-west over the range to Kuseik in the south of the Sèywa. Further south is the Kabaing-Alaungdaw track, used by pilgrims to the Alaungdaw shrine in February and March. South of this again is the Kabaing-Pyaswè-Sityin path, the main road from Kabaing to Mayin in the Shitywa valley. All these are foot-tracks and, except for one or two rough cart-tracks in the south of the Lègan Reserve over the Shwetagyi ridge to Kyetyin and Letpan villages in the Irrawaddy drainage, there is no good cart-road into the south-western glens, the Kuhnitywa and Shitywa, and the encircling reserves, except the Chinbyit-Aingma-Zeiktaung road, which has lately been repaired and made comparatively easy for cart traffic.

Other roads.

Besides the above tracks running east and west, the Forest Department have opened up a bridle-path from Kuseik to Mayin *viâ* the Alaungdaw. This road is 40 miles in length. Other branch paths lead from Mayin to Sityin, from Kyawdaw to Wetkya, in the Shitywa, from Yagyi to Bawdibin in the south of the Thingadôn, and from Yagyi south to Kabaing. By making firelines along the same alignments annually, the department has also opened up foot-paths in several other parts of the reserves.

Tracks over the Pôndaung.

The most frequented tracks through the reserves over the Pôndaung into adjoining districts are—(1) from Thitkauk in the Sèywa into the Taungdwin valley of the Upper Chindwin district, *viâ* Kaiklaikbin, which is well over 3,000 feet in height; (2) from Mindôn in the Patolôn Reserve up the Petpa stream and over the Pônnya range into the Gangaw valley of Pakôkku; and four tracks in the south-west of the district, all leading into the Kyaw valley of the Gangaw

subdivision of Pakôkku, namely, (3) from Mayin to Kye, a very steep road; (4) from Kyawdaw, north-west of Zeiktaung, to Saga; (5) from South Gyat, south of Zeiktaung, to Kyaw; and (6) from Kinè to Kyaw. Of the six paths, the first two are seldom used except by elephants of the forest lessees. The Gyat-Kyaw track is the one most used by pedlars proceeding into the Kyaw and Gangaw valleys.

A bridge, sixty feet long, across the Paya stream, immediately opposite the Alaungdaw shrine, has recently been made by the Forest Department for the benefit of pilgrims

Licenses for free timber for bridge building are given whenever asked for, but usually only narrow foot-bridges are built by the villagers.

Conservation of the forests: fire protection. Fire-protection was successful over 223,903 acres in 1906-07; 231,535 in 1907-08; and 234,770 in 1908-09. The number of fire-watchers employed is 232, under 16 subordinate officials; 159 miles of outer and 163 miles of inner firelines are cleared annually. The reserves not protected are the Patolôn Reserve, west of the Patolôn stream; the Thingadôn Extension; the Lègan Reserve; and the southern half of the Satha Reserve. The protection from fire has been successful on the whole, but the cost, which works out to about Rs. 37 per square mile, is high, and the doubt has been expressed whether the expenditure of so much money annually on the protection of reserves which contain much dry forest is advisable. The teak forests to the west of the Patolôn stream, which have suffered severely from fire for many years past, are in great need of protection, but to ensure this the Taungdwin Reserve to the west of the Pôndaung would probably require to be protected as well. In parts of the Satha Reserve and in the North Yama Reserve, where the *myinwu* bamboo (dendrocalamus strictus) has flowered and died over a large area between the Yama stream and the Mahudaung, a thorough burning of the forest for the purpose of consuming the thick layer of dry bamboo *dèbris* would, it is believed, be beneficial, provided the dry teak trees and logs were first extracted or, as far as possible, fire-protected. An unregulated spontaneous burning of the forest would do much damage to dead and girdled teak, to felled timber lying in the forests and to heaped logs in the streams.

Grazing. The area of reserved forest closed to grazing throughout the year is 706, and the area closed for part of the year 13 square miles. The area open to grazing throughout the year is 49 square miles. There is no restriction on grazing,

so far as the Forest Department is concerned, in the unclassed forest. In practice, villagers who live near reserved forests graze their animals in reserves where they like, the forest staff being inadequate to prevent them. It is estimated that 3,601 animals are grazed in reserved forests free, in accordance with rights admitted at the Forest Settlements As the total number of cattle in the district exceeds 250,000, it may be said that practically all grazing—if the law were enforced—should be carried on outside reserves.

Forest offences. The average number of forest offence cases is 60 *per annum*, of which about one-quarter are taken to court and the remainder compounded. Offences are, generally speaking, not serious, and the villagers near the Reserves are comparatively law-abiding. The number of offences unreported may, however, be great, for, during the dry season, almost the entire staff is engaged in fire-protection and other works within the forests, and no one is available to detect and report offences committed outside reserves.

Improvement of the forests. There are no regular plantations, but teak has been sown at stake in the flowered bamboo areas in the Satha Reserve, and small experimental patches of Andaman *padauk* and *sunzè* or *sunletthè* (cæsalpinia digyna) have been planted in the Pindaung Reserve. Much good is done on a small scale to the teak forests (usually in the areas within which the annual girdlings are carried out) by the systematic cutting of creepers and the felling or girdling of inferior species dominating the teak, and by the felling of teak and other trees which are badly attacked by epiphytic ficus. Paucity in the number of skilled subordinates renders improvement-fellings on a large scale impracticable.

Administration of the forests: establishment. The sanctioned strength of the staff on the 1st June 1909 was—*On the permanent establishment:* one Deputy Conservator; two Rangers, for the Pagyi and Kani ranges; four Deputy Rangers, five Foresters, twelve forest guards, four clerks, two range clerks, two elephant mahouts, and four menials One Probationary Ranger is on the strength, and awaits deputation to the Forest School. *On the temporary establishment:* four Deputy Rangers, four Foresters, four forest guards, one range clerk and three menials. Small monthly allowances are also given to ten caretakers at forest inspection bungalows.

There are four stations for the collection of forest revenue, namely, Mônywa, Alôn, Kônywa on the North Yama, and Sôngôn in the Shwebo portion of the Division. The Alôn revenue-station is the most important check station on the Chindwin. There are two drift-collecting

stations, at Alôn and Uma, opposite Mônywa: all the drift delivered by the licensed drift-collectors, the Bombay Burma Corporation, is delivered at Uma. The two principal rafting stations of the forest lessees are at Kaing village, a little above Alôn, and Kyaukmyet, at the mouth of the North Yama.

Near the eastern boundary of the reserves are the following Inspection Bungalows and wooden rest-houses, from north to south :— Forest inspection bunga-lows.

Yezo ...	...	Near the Thingadôn stream.
Bawdibin ...	...	
Shaukbin rest-house	...	
Kunbinyè rest-houses	...	Near the Mahudaung crest.
Yagyi ...	...	Near the Pindaung Reserve.
North Gyat ...	...	
Kabaing ...	...	Near the Sindôn Reserve.

Within the forests in the south-west, on the road from Kabaing to Sityin, are the two Ywama rest-houses, and at Aingma, on the road from Chinbyit to Zeiktaung, are two rest-houses. In the North Yama valley there are forest bungalows at Sityin, Segyi, south of Sityin, and Kyawdaw, and two rest-houses at Tinchaungwa. In the Patolôn drainage there are bungalows at Kuseik in the south, and Natma in the north, of the Sèywa valley, and two rest-houses at Tôngaung camp.

At first the entire Chindwin drainage formed one Forest Division, called the Chindwin Division, a Deputy Conservator, whose headquarters were placed at Alôn, being appointed in May 1887. In 1889-90 the headquarters were moved to Kindat, and in 1892-93 to Mônywa, where the Chindwin Division was divided into the Upper and Lower Chindwin Divisions. In 1896-97, the Mingin subdivision of the Lower Chindwin Division was formed into the Myittha Division. Changes in administrative boundaries.

Since that year the revenue has fluctuated considerably, being Rs. 63,106 in 1897-98, Rs. 93,612 in 1900-01, Rs. 40,557 in 1903-04, Rs. 18,267 in 1907-08 and Rs. 47,887 in 1908-09. The fluctuation is partly due to seasons of low flood in the streams, and consequent diminution in the number of logs brought to the revenue-stations, and largely to Lower Chindwin logs being credited in some years to other Divisions, owing to confusion in the hammer-marks struck on the lessees' timber. In the north, logs extracted from the Division have been credited to the Myittha Division and, in the south, about half of the Lègan Reserve is in the Irrawaddy drainage, and all the logs extracted from that reserve by the Bombay Burma Corporation are credited Revenue.

to the Yaw Division. This results in the Lower Chindwin Division being exhibited as working at a loss, whereas in reality there is a surplus of revenue. The absence of a local trade in teak and the fact that teak is given free for religious structures and works of public utility have to a small extent acted adversely on the revenue. The amount of unmarketed timber in the forests is also large. It is estimated that 20,000 teak logs are lying in the floating streams, and that the number of marketable dead teak trees standing in the forests approaches 10,000. The Division has as yet realized no revenue from this large quantity of teak. The advisability of increasing the rates of duty on *in* timber, and of taxing the fuel consumed in the palm-sugar industry has been suggested.

In 1908-09 receipts from timber accounted for Rs. 33,143: from bamboos for Rs. 2,147: from confiscated drift and waif wood for Rs. 7,994 and from miscellaneous sources for Rs. 3,393 of the total revenue.

Expenditure. The expenditure rose from Rs. 37,799 in 1897-98 to Rs. 70,435 in 1903-04, chiefly owing to the cost of surveying Reserves. It was Rs 50,020 in 1908-09.

Minerals.

There has been little exploration of the mineral wealth of the district up to the present. Platinum—according to early writers on Burma—was found in the Chindwin and its western tributaries, near Kani (Mason's *Burma,* reprint of 1882, Volume I, page 9). No recent report has been made of its existence There are the remains of old workings for copper sulphate in the Letpadaung hills opposite Mônywa. A license to prospect for gold, silver and copper in this neighbourhood was taken out in 1901 and renewed in 1902, 1903 and 1904, but no active measures of exploitation followed. Pyrites (*bahan*) occurs in the Kyaukka ridge. Garnet, tourmaline and spinels have been found near Salingyi, and gold is sporadically worked, on a very small scale and after indigenous methods, in the Hlaing stream, a right-bank tributary of the North Yama, which it joins at Chinbyit, in the south-west of the district. Alkaline efflorescence (*satpya*) occurs in many places, *vide supra*. Clay, laterite, and gravel are found all over the district. In 1908, 9,880 tons of clay, 10,242 of gravel, and 2,309 of sandstone were extracted.

Lime. Lime is slaked at Maukthayet, north-east of Yinmabin, and the adjacent villages. The limestone, locally called

hintha-kyauk, is dug out of gravelly hillsides on the east of the village, broken into pieces, running up to seven or eight pounds in weight, heaped, and a kiln excavated beneath for the fuel. The resulting powder is slaked with water. The slaked lime is used for the purpose of making good mortar, and when repeatedly slaked, can be consumed with areca nut. One kiln produces about one hundred baskets, or something less than two tons. The price per 100 baskets of lime at the kiln is Rs. 11 and there are about ten firings in the year. The industry is not widely followed, and the group of villages does not work more than fifty kilns in the year : some six or seven licenses only are issued. The fee is Rs. 10 *per annum* for a kiln. Working goes on in the cold weather. In Burmese times lime from Maukthayet was sold east of the river, but the import of Sagaing lime by rail has closed this market, and sales are now confined to the west. Within the last two or three years, the industry has spring up in Yemein village, south of Salingyi.

A little limestone is quarried for road metal on the east of the Chindwin, at Budalin and at Kyaukpyauk on the Kyaukka-Mu road. The figures of extraction for the whole district have averaged 350 tons in recent years.

Salt brine is extracted and concentrated in a group of eight villages in and near Salingyi. The labourers are for the most part women and children, who earn from Rs. 4 to Rs. 5 *per mensem*. The salt holdings, *sabaing*, are sometimes rented out at Rs. 2 per month. Usually the owner works himself, that is, he looks after the boiling, whilst hired labourers, chiefly women, prepare the brine. Some of the owners are well-to-do, but only about 15 *per cent.* are cultivators, and the hired labourers are decidedly poor. —[Messrs Wingate and Thurley's *Report on the Salt Industry in Burma*, 1908.] The wells—some of which are said to have been in existence for centuries, the traditional date of the earliest sinking being B.E. 726, A.D. 1364—are protected with a lining of slabs of stone or plank-walling, of teak or some other good wood. Depths are said to vary from 75 to 180 feet. The mouth of the well is narrower than the base. Complete renewal of a well—necessary once in twelve years or so—costs Rs. 150. The brine is drawn up in cylindrical wooden buckets, *in-dwè*, the empty bucket descending as the full bucket rises. The buckets are made at Yônbinyo and Mindaw villages, south of Salingyi The brine is poured into a small cistern dug near the well-head, and is carried thence and poured over the soaking-bed, *paing-ngan*, the soil of which has been Salt.

ploughed or otherwise loosened. After an interval of two or three days, the impregnated soil is dug up, powdered, and moistened repeatedly with brine. It is then collected and placed inside a vat, *painggwet*. More brine is poured on to it, percolates through the salt earth, and passes through pipes into receiving-pots, *kaung-yi-o*, in the shape of concentrated brine. This is carried to a shed and boiled. Boiling ceases before the stage of complete evaporation is reached, for, although the workers could boil the brine down to desiccation, they are afraid of the loss to their pots, to which the salt, if thoroughly evaporated, adheres, when the removal of the salt is apt to break the pots.

The daily average outturn of concentrated brine from a salt holding (*sabaing*) is said to be five viss, and the average annual outturn 1,800 viss, equivalent to 900 viss of dry salt. This estimate assumes that the well works daily throughout the year, but in rainy weather the process is suspended. The salt is not suitable for fish-curing purposes. It was analyzed in 1908 and found to contain, when wet, 77·76 and, when dry, 80·00 of sodium chloride, against over 97·00 per cent. in the case of Liverpool salt. This would account in part for the fact that the price of local salt has been consistently lower than that of imported salt.

There were in 1908 197 soaking-beds at work and the number of persons engaged in the industry was estimated to be 589, as follows—owners, 189; members of the family of owners, 150; hired labourers, 250. The extent of the industry is said to have diminished by two-thirds since Burmese times. The extraction is given in the returns at some 300 tons per annum, but the outturn is calculated on an assumed average annual production which cannot be regarded as reliable The outturn and methods are the same now as in Burmese times.

The wholesale price of local salt in recent years has fluctuated round Rs. 1-13-0 per maund, at Mônywa, this being always less, and sometimes considerably less, than the price of imported salt. The price of dry salt was reported in 1887 to be one anna per viss, or Rs. 1-6-0 per maund.

In Burmese times revenue was levied on Royal holdings only, not on privately-owned holdings, and the assessment was at so much per boiling-shed. [Messrs Wingate and Thurley's Report states that the duty was 20 viss of salt per pan (*sabaing*) per month.] Revenue is now assessed at a rate per soaking-bed, but the rate differs from one village to another, *vide* Chapter X.

The salt is more pungent in flavour than the salt

imported from Lower Burma, but the colour of imported salt is better. It is said that wherever the sale of local salt extends the people prefer it to imported salt: this merely amounts to saying that the taste for foreign salt is an acquired taste, like that for white millet. In Burmese times the sale of Salingyi salt extended to the Governorships of Amyin in Sagaing district, Alôn, the northern portion of Pahkan (Pakôkku), and also to the Upper Chindwin, the Yaw subdivision of Pakôkku, and the Chin Hills. Sales now extend only to the villages within a few miles of Salingyi.

An insignificant amount of salt is worked in occasional years at Kyaukka, the source of supply being a brackish stream.

There is no special establishment for the supervision of salt manufacture

Petroleum. The occurrence of petroleum at 'Pôndaung' in the Lower Chindwin district is reported at page 137, Part II, *Memoirs of the Geological Survey of India*, 1895. The locality is probably that west of Kin (in the Mahudaung, not the Pôndaung), in which experiments were carried out—unsuccessfully—by the Burma Oil Company, between 1903 and 1905 Eight applications to prospect for petroleum in the Kani township were received in 1902, and there were numerous applications in the succeeding year, but Messrs. Finlay, Fleming and Company for the Burma Oil Company alone received a license. Good results were not obtained, and the license was surrendered. Petroleum occurs in the bed of a stream a few miles from Kinè, in the south-west of the district. Shallow wells are dug and the oil percolates out, along with water. There are also numerous places in the reserved forests in the west where occur oil-springs or escapes of inflammable vapour, *vide* Chapter I.

Coal. Coal has been reported as occurring in the Kin village-tract, and applications to prospect for coal in that neighbourhood (in 1905) and near Lèdama in the south-west of the district (in 1908) were made, but were subsequently withdrawn.

CHAPTER VI.—Occupations and Trade.

Occupations.

Census of occupations. Although the preponderating vocation is agriculture, the district has a number of non-agricultural industries. At the

Regular Settlement, occupations were abstracted from the *thathameda* rolls of the year 1906-07, and the chief categories were found to be :—

Vocation.	Number of households.	Vocation.	Number of households.
Cultivators ...	35,724	Saddlers ...	165
Cultivators, with some subsidiary occupation.	3,661	Physicians ...	155
		Musicians and dancers	148
Unskilled labourers (coolies).	12,736	Monastery scribes ...	142
		Shoemakers ...	139
Traders ..	2,413	Tattooers ...	61
Petty traders ..	1,891	Masseurs ...	57
Tari climbers ..	983	Mahouts ...	54
Cloth-weavers and spinsters.	882	Masons . .	50
		Pig-breeders and pony traders.	50
Bamboo plaiters ..	562	Cloth sellers . .	48
Carpenters ..	466	Beggars ...	38
Sawyers ...	279	Lacquer workers ...	35
Cartmen ...	277	Salt-boilers ...	35
Fishermen ...	272	Cattle-breeders ...	31
Betel-vine tenders ...	226	Brokers and money-lenders.	30
Tailors ...	180		
Blacksmiths ...	180	Miscellaneous ...	331
Gold- and silversmiths	168		
Brass- and coppersmiths	166		

The 226 betel-vine tenders cultivate the vineries in Nyaunghyubin, south of Mônywa, and are agriculturists, and, as the rolls often err in the direction of recording under a non-agricultural heading, a person who combines with cultivation some other occupation, especially in the categories of carpenter, *tari*-climber, sawyer, cartman, fisherman and cattle-breeder, the number of households engaged in cultivation is really greater than the figures show. Of the non-agricultural categories, the unskilled labour is mainly dependent on agriculture, the coolies being for the most part field-labourers employed throughout the year in the district, or persons who emigrate to Lower Burma, also, in most cases, for the purpose of working in the fields. The figure of cloth-weavers and spinsters is swollen by the inclusion—under one or the other heading—of most of the widows and old women. The number of professional weavers is not so large as the figures suggest. Mason is often a synonym in the rolls for unskilled labour of any kind,

and masseur for the man or woman who earns a trifle occasionally by massage, without following the art as a sole means of subsistence. The professed cattle-breeders are few in number, but nearly every cultivator, except in the inundated tract below Mônywa, breeds and sells a spare bullock occasionally.

Temporary emigration. Whether the unskilled labourer will emigrate or not depends to a certain extent on the nature and prospect of the season. If it is good, or promises to be good, many reside in the villages throughout the year, but a numerous section emigrates annually.

The lines of emigration are four —(*a*) South: the most numerous section go from the south-east of the district to Lower Burma, either the whole way by rail, or by rail as far as Myinmu in Sagaing district and thence by Irrawaddy Flotilla Company's steamer, or by raft down the Chindwin On arrival in Lower Burma they take work for the ploughing and succeeding agricultural operations, and—after reaping—any work that presents itself. (*b*) South-east: to Mandalay for miscellaneous porterage work, the emigration being confined to a small area in the cotton region. (*c*). North and north-west, to the Upper Chindwin for sawyers' work. (*d*) East, to the canal works in Shwebo, from the tracts adjoining the Mu river.

Generalizing, it may be said that north of Kani the emigrants—a small section of the people—go north, and south of Kani—a large section—go south. A double trip is hardly ever made in the year. Lower Burma is distant, and the trouble and expense of going and returning, first for the ploughing and afterwards for the reaping, are prohibitive. There is some emigration for other purposes than agriculture, *e.g.*, for peddling oil in Lower Burma villages. Of the emigrants, those who are not cultivators go down in May or June and return in February and March. If the season has declared itself and will be a bad one, the agricultural section, leaving their wives and children to reap what little crop there is, follow in October and November, to return in March and April. In the Budalin township, along the Shwebo border, where the crops are much preyed upon by elephant, the women and children alone cannot frighten the animals away, and if the crop, although poor, is not a complete failure, the men must wait to reap it. They cannot get away till January, their emigration is curtailed to a few months, and they arrive in Lower Burma too late for the harvesting.

In the category of coolies fall also those persons who engage themselves to the owners of large country-boats, which they tow or pole upstream: those who help to propel the flotilla of rice and timber rafts which come down every year from the Upper Chindwin; those who assist the master-worker in such crafts as lacquer-work; and often the pedlar hired by the middleman to go from village to village with goods for sale.

Traders and petty traders. Traders includes the owners of large country-boats in the riverine villages; the middleman generally, who buys products for sale in a rising market; the small shop-keeper, the lower room or verandah of whose house serves as a store for the supply of articles of daily use: and the cart owner who goes round from village to village with commodities purchased at the trading ports, Alôn, Satôn, and Mônywa. The line between the trader and the petty trader is not clearly defined in the *thathameda* rolls, and the pedlar who carries cloth round at his own risk is often classified as a trader. To the class of petty traders are, however, assignable the great majority of the pedlars, and all the women who make a living by carrying round, in baskets on their heads, vegetables and small supplies of other daily requirements.

Other occupations. The palm-sugar industry is described in detail elsewhere. Cloth weavers are found on the cotton plateau and near Salingyi, *vide* Chapter III. Many of the bamboo rafts which come down from the Upper Chindwin laden with rice dispose of it at the villages they pass and are broken up at Alôn, where the bamboos are sold to a group of villages round Kawègyin. Here are made large numbers of mats, winnowing trays, baskets, and other plaited articles, and these are exported, besides supplying the needs of all the villages east of the river and some of the western villages. Under the western hills, bamboos are also extracted and converted into mats, the hoods of carts, and other articles. Sawyers and carpenters go as journey-men in search of work on the construction of monasteries or private houses. Those living in villages in the north of the district often look first to the Upper Chindwin for employment. Cartmen are confined to the villages near the large trade centres, along the main roads, namely, the roads between Ywashè, opposite Mônywa, and Yinmabin; Satôn and Salingyi; Mônywa and Alôn, and Mônywa and Myinmu. Fishermen —often recorded in the rolls in euphemistic ways in order to slur over the discreditable nature of the calling—work at a share of the profits under the licensee of the fishery.

They usually employ nets, but occasionally fish with fixed rod and line, or with a short line attached to a floating gourd, which is allowed to drift downstream and is retrieved, with the catch, lower down. Tailors are found in many villages, but are most numerous in the neighbourhood of Mônywa, where hand-woven articles are going out of use and their services are required to make up the material purchased in the piece. Isolated smithies are found in many villages, but most of the blacksmiths congregate in Baunggya village on the Mu, and in Byammadat and Panywa in the south-west of the district. Baunggya makes jungle-cutting knives and supplies the east of the district. Byammadat makes sickles, and Panywa jungle-cutting knives. Mônywa has a few households of craftsmen who cut out of sheet iron the concentric circlets which form the spire (*hti*) of a pagoda. The goldsmiths and silversmiths are not found congregating in particular villages, but one or two in nearly every large village; there is nothing distinctive or excellent in their art, which is confined to the making of bracelets and ear-ornaments, usually in gold. Wrought brass work—gongs, bowls, the bells carried by cattle, and betel boxes—is made at Indaing, north-east of Mônywa, and cattle bells, pagoda bells and roughly cast miniature representations of episodes in the life of the Buddha at Kyehmôn. The gongs made at Indaing have a wide reputation for excellence.

The industry of making Burmese saddles and the appurtenances centres in Kye-hmôn, south of Mônywa, and comprises several subordinate industries. The first is the making of the actual saddle. The cloth for the seat is purchased at Mandalay; the inner lining is often woven in the village. The stuffing is either the seed of the *ônbwè* (literally, *stuffing*), a small bushy plant grown as a field crop round the village—additional supplies are said to be purchased from Myingyan at a price of half an anna a basket; the down of the cotton-tree, *bombax malabaricum*—an ordinary price for the latter is said to be four viss for a rupee; or the down of the *mayu* [Stevenson, the *mudar*], a common jungle plant. The needles used are purchased from Mandalay, and the thread is spun in the village. Most of the saddlers, of whom there are about fifty, work for themselves, but there is some hiring, and hired workers are paid by the piece. A separate industry is the embroidering of the saddle in coloured silks in a raised design, which is often elaborate. This work is generally done by the women of the house, but there is some hiring, when payment is made by the piece and varies with the simplicity or

Saddles.

otherwise of the stitch. This work is always done by women. The embroidered saddle is either sold to merchants in the village, of whom there are several, or a carrier is hired to travel from village to village with a load of several saddles for sale retail. The price of an ordinary embroidered saddle varies from Rs. 6, for a saddle with tree-cotton stuffing, to Rs. 12 for one stuffed with *ônbwè*.

The making of the reins, the crupper, and the tasselled cords suspended from the crupper is separate. Both women and men engage in this work. The stuffing of the reins is made of yarn spun in the village, and the outer covering is woven of foreign imported cotton. About twenty households are employed in this branch of the industry.

The making of the headstalls is also specialized, and this work is done by women. Women also make the webbing (*gyit*) which serves for girths to the saddle, straps for pattens—which are also made on a large scale in this village—and webbing for bedsteads.

Other Industries. Monastery scribes engrave Buddhist religious writings by means of a style on sections of the leaf of the palmyra palm; the leaf, when the writing is finished, is smeared with earth-oil, in order to darken the script and throw it up. Thakuttanè, in the north-west of Budalin township, turns out in large numbers the fans used by Buddhist monks. They are circular in shape and are made out of the leaf of the palmyra palm. Wooden pattens are made at Kyehmôn out of wood of the *shitsha* (cicca albizzioides) and *sit*, a kind of acacia. The timber is usually floated down from the Upper Chindwin, but there is a small import from Katha by train. Kanbya makes leathern sandals, *peindan*. West of the Chindwin, an occasional house turns out the sandal of buffalo and ox-hide worn by the Buddhist monk. Tattooers congregate in Wayaung, in the south of the cotton country, and go far afield pursuing their art, proficiency in which appear to be hereditary. The mahouts are confined to the villages in the Thingadôn and Sèywa glens, and are in the employ of the Bombay Burma Trading Corporation. Masons include, besides bricklayers, the master-workman who ornaments in stucco the outside of pagodas. The professional beggars are the descendants of pagoda slaves, and are grave-diggers also.

Lacquer. The two villages of Kyaukka North and South, with 350 and 120 houses respectively, are engaged in the industry of manufacturing bamboo lacquer. It is not known when and by whom the industry was introduced. There are at the present time five small firms which supply funds and

material and employ about 80 men, 100 women and 100 girls daily. The industry is carried on throughout the year, but the rainy season is most suitable. The articles manufactured are trays, up to 16 inches in diameter; sets of trays in tiers (*ôkkwet*), running up to two feet in diameter of the lowest receptacle; bowls, running up to one foot in diameter; and small boxes. The variety of bamboo used is the *tinwa*, which is imported from the Upper Chindwin, the quality which renders it suitable being its pliancy. Each bamboo is cut up into lengths of three or four feet, and each length is split into ten or twelve pieces. The knots, the outer covering, and the pith are carefully removed, and the remaining foil is finely dressed and coiled into the desired shape. Over this shape, a thin coating of *thitsi*, the varnish extracted from *melanorrhœa usitata*, the wood-oil tree, is applied, and the shape is left to dry in an underground chamber. When dry, fresh wood-oil, mixed with fine teakwood saw-dust, is applied. Wood-oil and saw-dust (*thayo*) are next applied to the inside of the shape and, when dry, roughnesses are removed by friction with a stone. A mixture of ash and wood-oil is next applied and, when dry, the surface is again rubbed smooth with a stone, and the process is repeated. A thin coating of pure wood-oil is then applied and the article is polished with the rough leaf of the *dahat* (tectona Hamiltoniana). Another coating of wood-oil is applied, and the article dried and polished with soft dust obtained from crumbled fossil-wood. It is then placed in water and carefully cleaned. A coating of vermilion mixed with *shansi* (Shan oil) and wood-oil is finally applied to the inner face and left to dry, and the article is complete. In all Kyaukka lacquer-work the exterior face is of an unrelieved black colour, and the interior of an unrelieved vermilion. The vermilion (*hinthapada*) is made from a mixture of *hinsaing* (cinnabar, red sulphuret of mercury, *Stevenson*) and some other unknown ingredient, in Mandalay. The formula is a trade secret, and it is said that there are only four persons in Mandalay who are acquainted with it, and that it is so closely guarded that a husband will not impart it to his wife and a father only to the most trusted of his sons. The price at Mandalay is Rs. 10 per viss. Little is known locally about the Shan oil, beyond the fact that it comes from the Shan States and is the oil of some kind of seed. It is sold at Rs. 2 per viss at Mandalay.

Each article requires from two-and-a-half to three months to complete. The hours of work are from 8 A.M. to 4 P.M.

A man earns on the average five annas a day; a woman three annas; and a boy or girl two annas. About Rs. 10,000 worth of lacquer are exported to Lower Burma annually. With the improvement of communications by rail and steamer, the industry has expanded and the demand is rising. The large *ôkkwet* are used when making ceremonial offerings to monks; the ordinary trays by women, for carrying fruit and vegetables to market; and the bowls and small boxes for miscellaneous domestic purposes.

Maungdaung turns out the shallow stands on which the dishes are arranged at meal time, *daunglan*.

Other industries. A little salt is produced in Salingyi and the neighbouring villages. The industry has been described in the preceding chapter. A few households in Nyaungbinlè village tap the wood-oil tree, *vide* Chapter V, and sell the resulting varnish, which is used to protect the exterior of the more valuable of the baskets in daily use, for instance the village measuring-basket of sixteen *pyi* (nine gallons) capacity. Earthenware pots of various shapes and sizes are made at Ayadaw, at Yèdwet on the Shwebo border, and west of the Chindwin at Salingyi and Obo, *vide* Mr. Taw Sein Ko's monograph on *Pottery*. They are not glazed. Lèzin, a few miles south of Mônywa, makes ornamental haircombs of *kyungaung-nwè* (?) wood, the log being imported by rail from the Upper Chindwin to Kyehmôn, and carted thence. The industry does not differ from the description given in the Shwebo Settlement Report.

In the Sèywa, a few households in the southern villages of Kuzeik, Pwinga, and Saingdè breed silkworms. There is a tradition that the industry spread into the glen from Ava, where it was followed by prisoners of Alaungpaya, captured at the conquest of Assam in 1755 A.D. The silk obtained is too coarse for use and is mixed with foreign silk before being woven.

Yônbinyo village, near Salingyi, besides making the chimney-pot-shaped wooden buckets used in the brine-wells, plaits from imported bamboos a small barrel-shaped basket, *yebôn*, which, when coated with wood-oil, serves to bring up water from the village well. These are exported to the villages east of the Chindwin. Farther south, Yemein village makes baskets (*tagaukpa*) out of the outer covering of the leaf of the *tari* palm.

Forest occupations. The forests provide permanent occupation for mahouts, subordinate officials of the Forest Department, and employés of the Bombay Burma Trading Corporation, and occasional labour to the villages near the Reserves, in cutting, watching,

and clearing fire-protection lines and forest roads: in the extraction of bamboos, to be converted into mats, and of other minor forest produce; and to the camps engaged in boiling down the wood of the cutch tree into blocks of cutch for the market. The cutch trade is in the hands of Chinese merchants in Mônywa, who often finance the camps. Outside reserves, the trees are in places being worked out, and the cutters have to make longer journeys to find trees. The increased expenditure on labour is eating into the profits, and there are also complaints that the Chinamen in Mônywa use false weights, when buying the outturn. The industry will no doubt flag, if it is restricted to areas outside reserves, but there are no signs of diminution at present.

Local distribution of occupations.

The western and northern regions, in the zone of better rainfall under the hills, together with one or two specially favoured tracts elsewhere, for instance the inundated region south of Mônywa, are pre-eminently agricultural It is in the south-east of the district that are found most of the non-agricultural avocations outlined above. The occupations of the people were censused by Settlement soil-tracts in the year 1906-07, and it was found that the tracts occupied by the Mônywa and Budalin townships comprised not more than one-third of the whole number of cultivators pure and simple, whilst nearly all of the part-cultivators, part-non-agriculturists came from the two townships, which returned two-thirds of the whole number of petty traders, all the cloth-sellers, and the great majority of the cloth-weavers, bamboo-plaiters, carpenters, sawyers, tailors, blacksmiths, gold- and silversmiths, brass- and coppersmiths, musicians and dancers, saddlers, monastery scribes, shoe-makers, tattooers, lacquer workers, cattle-breeders, masons and domestic servants. The mahouts, the cutch-workers and the salt-boilers belong to the western regions, as do the bulk of the palm-sugar workers. Traders, cartmen and unskilled labourers are about equally divided between the two sections of the district. There is great diversity of occupation in the riverine villages, along the Chindwin. A village with certain and good inundation may contain no households except of agriculturists or field labourers; others may contain few but boat-poling coolies; others—where the set of the current has laid bare a shelving bank suitable for mooring their large trading-boats,—a number of well-to-do ship-owners. Generalizing, it may be said that the occupations of the people west of the Chindwin are almost exclusively farming, and that, east of that river, there is a large admixture of miscellaneous artizans and craftsmen,

a good deal of annual emigration, and extensive trade in cattle.

Mills and factories. There is no factory labour in the district, and the only steam-driven mill is a small saw-mill, belonging to a native of India and situated on the outskirts of Mônywa.

Trade.

Trade in Burmese times. No details of the trade of the district in Burmese times are available. The right of collecting miscellaneous revenue, comprising dues on forest produce, customs, ferries, bazaar stalls, fisheries and brokerage, was farmed and realized Rs. 35,000 *per annum* [*Gazetteer of Upper Burma*, Part II, Volume II, page 86].

Markets. There are daily markets at Mônywa (a Municipal market), and Salingyi. There is a District Fund five-day market at Satôn. The collection of market-rents in 1907-08 was—at Mônywa, Rs. 8,898; at Salingyi, Rs. 743; at Salôn, 645. The collections appear to have diminished in recent years. As the Municipal and District Funds incurred expenditure on the construction of buildings and the entertainment of a supervising staff, the results are disappointing.

Markets now abandoned. There was a five-day market at Ngakôn from 1890-91 until 1904-05, a daily market at Alôn between 1894-95 and 1904-05, and at Budalin from 1891 to 1905-06. Thazi village had a Government market for four years and Palè for two. Both were abolished after 1894-95. Receipts had in all cases dwindled to an insignificant figure before the markets were abandoned, the process of decay being expedited in some cases by the decision that market-fees could not be taken from shops outside, but in the vicinity of, the market.

Local substitutes for markets. There is no indigenous custom—as there is in some of the districts east of the Irrawaddy—of each large village holding a market every five days, and this to some extent accounts for the apparent failure of the markets. Inland, commodities are either carted for sale from village to village, carried round by pedlars, or—in the case of perishable fruits and vegetables and miscellaneous lighter articles generally—by women, on their heads. In the larger villages, the lower part of the house occasionally serves the purpose of a shop. The seller can, however, never make sure of meeting a large number of prospective purchasers—as he would do in a market—and this, in the case of fruit and

vegetables, is an effective check on extension of that form of cultivation, and the absence of markets—this statement particularly applies to the more fertile tracts in the south-west of the district, from which there is least emigration—also tends to keep the standard of living low, by leaving the people in ignorance of the existence of small luxuries. It would appear to be advisable to maintain existing markets and attempt new ones, but the erection of a single market-building, if of some degree of permanency, would strain the small resources of the District Fund. It has been suggested that a circuit of markets, housed in inexpensive bamboo structures, so that the loss would not be great if they did not attract, might be created in five of the larger villages in the south-west of the district.

Distributing centres and pagoda fairs.

The chief distributing centres are :—

East of the Chindwin—Mônywa, Alôn, Budalin, Thazi, and Ayadaw.

West of the Chindwin—Satôn, Salingyi, Yinmabin, Kyaukmyet and Kani.

The annual pagoda and spirit festivals at Paungwa, Powindaung, Lè-ngauk, Kyadet, Zidaw and Pyanhlè, west of the river, and at Alôn, Kyaukka, Natgyi, Sinyan, Maungdaung and Wunbo, east of the river, serve the purpose of fairs for the retail disposal of commodities of local or external origin.

Exports.

The principal exports from the district are—a little unhusked rice from the north-eastern riverine villages into the neighbouring Hnaw tract of Shwebo, and from the south-western tracts into Pakôkku ; cotton, sesamum seed and oil, and a little oil-cake ; millet, both red and white ; beans of many sorts, chiefly the red bean (*pègya*), the small green bean (*pèdi*), the large aromatic white bean (*pègyi*), the late bean (*pènauk*), and gram ; groundnuts ; onions ; maize-spathes ; palm-sugar ; tamarind fruit ; cattle, hides and horns ; pigs ; teak ; a little timber of other sorts ; cutch ; a little salt ; coarse cotton cloth made from Burmese thread spun locally ; Burmese saddles and trappings ; the fans used by Buddhist monks ; mattresses and cushions ; baskets, mats, and plaited articles ; a little silk ; a little lacquer-ware ; brassware ; and wooden pattens.

Imports.

The district imports salt fish ; compressed fish (*ngapi*) ; fresh fruit ; husked and unhusked rice ; cocoanut oil ; flour ; maize-spathes from the Yaw subdivision of Pakôkku ; salt ; sugar; pickled tea ; areca nuts ; crude and refined petroleum ; lime ; piece-goods ; silks, chiefly Japanese, but there is a small import trade in the Yaw *paso* or skirt, woven in the

Pakôkku district, and in Mandalay silks; cotton thread; hardware and cutlery; glassware and crockery; candles; matches, chiefly Japanese; umbrellas; various sorts of timber, teak and *padauk* for the manufacture of cart-wheels, timber of the *hnaw* tree (nauclea cordifolia) for the manufacture of ornamental hair-combs, and of other sorts for house-posts and pattens; bamboos for house material; steel for the use of the village smith; and miscellaneous articles of domestic use.

Lines of trade: (a) the railway. The length of railway-line in the district is eighteen miles only. In 1907 the railway carried 6,370 tons outward, and 7,559 tons inward: the figures for the first half of 1908 were—outwards 4,301, inwards 6,937 tons. The railway does not tap that part of the district in which the surplus agricultural produce accrues, namely, the Salingyi and Palè townships, and the river is a competing means of transport. The figures are for all the four stations falling within the district added together; the amount of traffic which enters the train at one station within the district to be consigned to another within the district is no doubt negligible.

(b) The Chindwin. The Chindwin trade is carried by (i) the Irrawaddy Flotilla Company's steamers; (ii) large, masted, country-boats—the largest, not able to go further than Mônywa, called *hnaw*; the smaller ones, called *pein*, *laung*, and *tabagyi*—running up to two thousand baskets* burden: and smaller boats, *lôndwin*, of one or two hundreds burden; and (iii) rafts, sometimes of large size.

The Irrawaddy Flotilla Company. The Flotilla steamers call for cargo at Paungwa, Ywashè opposite Mônywa, Mônywa, Alôn, and Kani. Their service does not, however, attempt to carry the whole, or even a considerable portion of the trade. The Manager of the Company has kindly supplied the following figures of the merchandize carried in the three years 1906, 1907, and and 1908:—exports to Rangoon, 3,286, 4,355 and 2,547 tons; imports from Rangoon, 2,515, 2,400 and 1,455 tons. The chief items of export are cutch, palm-sugar, beans, hides and horns; of import, salt, piece-goods, matches, iron and steel, and miscellaneous articles. The figures presumably do not include the tonnage—possibly of small amount—imported from or exported to stations intermediate between the district boundary and Rangoon. They show the cessation of demand after a bad year such as 1907-08.

Country-boats. The native trading-boats—the larger owned from Pakôkku, the smaller from the Upper Chindwin—usually

* The village basket contains from 40 to 50 pounds' weight of unhusked rice.

come up from the Irrawaddy with pressed fish, salt, petroleum and, to a smaller extent, tobacco from the islands in Pakôkku and Sagaing, chillies, areca nuts, water-pots, glazed 'Pegu' jars from Kyaukmyaung in Shwebo, and miscellaneous articles, discharge a large portion of their cargo at Satôn or Mônywa, fill with palm-sugar, sesamum oil and tamarind fruit, and proceed upstream, disposing of their goods at the larger villages on the banks. They bring back from the Upper Chindwin husked and unhusked rice, which they discharge at Satôn, refilling as before, and with beans in addition, for the down voyage. Two journeys can be made in the year—the first upstream in December and January, returning in March and April, the second upstream in May, returning in October. When, as is nearly always the case on the first journey, the wind does not serve, the boat is laboriously towed up or poled.

There is no rafting upstream; the usual procedure of a rice rafter is to proceed to the Upper Chindwin either by Flotilla steamer or on foot and lay out his capital on the purchase of unhusked rice, and a ready made raft, or the bamboos for a raft, large enough to carry it. On the floor of the raft small temporary bins are made of bamboo-matting and roofed with thatching grass, and in these the grain is heaped. The largest raft has space for fourteen of these improvised granaries, seven on each side. Labour is hired for rowing the raft down, and the voyage often ends at Alôn, where the rice is sold, the raft broken up, and the bamboos sold also. Usually only one voyage down is made in the year. The number of rafts registered at Alôn by the Forest Department in the year ending the 30th June 1909 was— **Rafts.**

Arrivals	...	...	2,041
Departures	...	...	1,743

About half the registrations were bamboo rafts. It is probable that many rafts escaped registration.

There is no rafting of rice along the Mu. Country cargo-boats ply, but the months in which a passage is practicable are five only—the rainy months from May to September. The boats fill with kerosene oil, compressed fish, sesamum oil and tobacco at Myinmu, and sail or pole upstream, selling as they go. For the return voyage they fill with rice from Katha and Shwebo, which they dispose of in the Sagaing villages. They can make two voyages in the season. **(c) The Mu.**

(d) Cart-roads. All the rest of the trade of the district is carried by road, and cart-roads, not always available throughout the year and often far from good, traverse the cultivated area except—

(a) along the bank of the Chindwin, on both sides, north of Kani;

(b) into the Sèywa, in the north-west of the district.

As regards (a), the villages on the bank have a convenient waterway, and a cart-road into the Sèywa (b) could only be constructed at great expense. Communication by cartroad with adjacent districts is possible except—

(a) west over the Pôndaung range into the Yaw subdivision of Pakôkku;

(b) north and north-west into the Mingin subdivision of the Upper Chindwin.

The construction of a cart-road over the Pôndaung would be costly, and the trade—consisting, inwards, of the skirt known as the Yaw *paso*, and of maize-spathes, and outwards of palm-sugar and Japanese silks—is not extensive. A road from the Sèywa into the Upper Chindwin would lead into the Taungdwin valley, which is itself land-locked.

Chief trade routes by road. The chief lines of trade by cart are :—

East of the Chindwin—

(a) The Mônywa-Budalin road, which carries an import trade of unhusked rice from Shwebo, and conveys the surplus millet and green bean *(pèdi)* from the central portions of the Mônywa and Budalin townships.

(b) The Mônywa-Ma-gyi-zauk road. Palm-sugar and green bean from the Kyaukka plateau follow this route.

(c) South from Ayadaw in the centre of the same plateau to Myinmu in the Sagaing district. The bulk of the cotton follows this road.

(d) The Mônywa-Myinmu road. Into this road converge the village roads along which the red bean and ground-nut pass from the inundated tract west of Nyaungbyubin, and there is also heavy general traffic between the Sagaing and Lower Chindwin district.

West of the Chindwin—

(a) The Lè-ngauk-Salingyi road.

(b) The Kyadet-Salingyi road.

The former of these roads has a continuation west to Chinbyit, and also receives a feeder road from Palè. The

two roads bring into Salingyi most of the surplus sesamum seed from the Salingyi, Palè, and the south-west of Kani, townships together with most of the surplus gram and late bean, *pènauk*.

(*c*) From Salingyi a main road leads to Satôn on the river, where the products mentioned are sold to the large boat-traders.

(*d*) The Yinmabin-Palè-Kyadet road carries to Pakôkku a certain amount of sesamum seed and cotton, together with the surplus rice from the south-western rice-growing tracts.

(*e*) The Yinmabin-Ywashè road carries cutch from the forests in the west of the district, late bean and sesamum from parts of Kani township, and there is a large passenger traffic. This road also carries into the palm-sugar tract between the Salingyi uplands and the river the firewood cut on the northern slopes of Powindaung.

Distribution of exports. Of the exports, the surplus cotton from the cotton tract is carted south to Myinmu and is taken on to Myingyan to be ginned. Of the small amount produced west of the river, a little is exported by cart to Pakôkku. The surplus sesamum from the south-west of the district is purchased in the seed by oil pressers from Sônda and Salingyi. The Salingyi delivery is expressed and carted to Satôn, for shipment by river up and down stream. The Sônda portion—relatively inconsiderable—is exported to Pakôkku by road. The crop from the north-west of the district goes in part to Salingyi and in part direct east to Kani and the larger riverine villages, for sale to the large trading-boats. The sesamum from the south-east of the district finds its way to Alôn and Mônywa, that from the north-east to Shwebo and Myinmu in Sagaing takes the surplus from the Mu valley and adjoining region.

The surplus red millet of the south-west of the district is purchased in cart-loads at a time by Pakôkku villagers, or sold to local merchants, who store it for sale, chiefly to Pakôkku villages, but occasionally to Satôn for export by river. East of the Chindwin, the white millet from the low land along the foot of the Kyaukka hills leaves the district by rail. Some is said to be purchased from Sagaing, in order to be ground and mixed with wheat flour, and some goes down to Rangoon. The red bean (*pègya*: the Rangoon trade reports probably mean this bean when they speak of *Pai Hin*) from the alluvial lands south of Mônywa is purchased through Burmese brokers, some of whom live in the villages, by Chinese traders in Mônywa,

and is exported by train to Rangoon. The ground-nut trade, still in its infancy, is in the same hands and follows the same line of export. The green bean, *pèdi*, is carted south and west into Mônywa. The late bean, *pènauk*, is purchased from the cultivators in the west of the district by traders, mostly from Yinmabin, Salingyi and the riverine villages, carted to the Chindwin, and exported in country boats down-stream to Lower Burma. The ultimate purchasers are said to be natives of India. Most of the gram produced west of the Chindwin is sold to the owners of trading-boats and also taken south The Ngakôn onion crop is, for the most part, purchased by the owners of country-boats and taken up and down stream. A little is sold to Pakôkku villagers, being exported by cart Most of the palm-sugar manufactured in the groves on the west of the Chindwin is purchased—often for forward delivery—by traders in the riverine villages, and finally sold to boat-owners and exported by river, the bulk going down-stream, but a little north to the Upper Chindwin. A small amount goes west by carrier over the Pôndaung into the Yaw subdivision of Pakôkku. From the tracts east of the Chindwin which make palm-sugar the yield is purchased—also in many cases for forward delivery—by Mônywa traders, who send it down to Rangoon by train Tamarind trees are plentiful on the village-sites in the south-west of the district, and there is some export of the fruit—in part whole and in part with the stone removed—*viâ* Satôn, the middlemen being the large boat-owners, or else traders from Pakôkku.

Cattle are bred most extensively in the villages of the Mu-Chindwin upland and to the north-west and west of it. Purchasers come up to buy, and take away the animals by road; most sales are made early in the year, in April and May, to be ready for the ploughing season. Export is sometimes made by raft. The speculator buys a number of cattle on credit, rafts them down the river, and—if successful—pays the agreed price on his return and retains the difference as his profit. Hides and horns are brought into the large villages and finally make their way into the godowns of Messrs. Fabricius and Company at Mônywa. The hides are said to be of good quality, but small. A few buffaloes from the northern tracts are sold to purchasers from southern districts, who drive the beasts as far as Alôn and there entrain them. Cutch is carted to the godowns on the Chindwin bank, chiefly at Ywashè opposite Mônywa, and taken down by steamer. Most of the salt produced near Salingyi is sold locally. It is carted round in kerosene-oil

tins in the form of brine, or carried on the shoulder in the same receptacle. Little of the production is sold dry. Export of Burmese saddlery and appurtenances is by train.

Distribution of imports. Of the imports, most of the compressed and salt fish comes up in country-boats from Lower Burma, is disembarked at Satôn or Mônywa, and disposed of to small traders, to be carted for sale from village to village or else deposited in their houses to await customers. The railway also brings in a large amount. The eastern half of the district obtains its requirements of rice either by train—probably from Katha—or from supplies rafted down the Chindwin to Alôn. If the cultivator wishes to buy more cheaply than can be done by purchasing locally he follows the Budalin-Ye-u road into Shwebo, probably filling his cart with red bean, salt fish or sesamum oil at Mônywa, and returns with unhusked rice, purchased at fifty rupees for a hundred baskets in Tabayin, a part of the Ye-u subdivision of Shwebo district. Every year strings of carts can be seen following this route. In the north of the district the cultivator frequently makes a journey north and purchases in the Upper Chindwin just sufficient for his own requirements, rafting it down in the usual way The Flotilla Company in most years sends up to Mônywa a flat laden with salt, and the trading-boats also bring it up. Some comes in by rail also. Petroleum arrives in the country-boats from the oil-fields at Yenangyaung. Timber is for the most part floated down from the Upper Chindwin. The other miscellaneous articles of import arrive by rail and all are distributed by cart and carrier.

Prices. Prices of field-products have risen largely since Burmese times. At the Regular Settlement of 1906-07 the prices of that year and the preceding three years were recorded, and disclosed a steady and marked rise in the four years. Prices are highest in the neighbourhood of Mônywa, where the river and the railway afford facilities of export, and rise generally with proximity to roads and means of transport. The variations from tract to tract are great At Mônywa, the average prices assumed were—unhusked rice, Rs. 105; white millet, Rs. 105; sesamum seed, Rs. 395; and red bean Rs. 112, per 100 standard baskets.

Retail prices have also risen, but not to a large extent, since annexation. The figures are shown in the B Volume of the District Gazetteer.

Weights and measures. The measures in local use are the *tin* or basket, varying from village to village, but nearly always a little less than the Government nine-gallon measure, and its components, the *pyi*, one-sixteenth, and *salè*, one-sixty-fourth. They

are plaited of strips of bamboo and are usually protected from weathering by means of a covering of wood-oil. The weights used in the villages are often lumps of stone, and are the viss of 3·65 pounds and its one-hundredth part, the *kyat* or tical.

CHAPTER VII.—Means of Communication.

The railway. The Sagaing-Alôn section of the Burma Railways, which was surveyed in 1896-97, constructed between September 1898 and April 1900, and opened for traffic of all descriptions at all stations on the 15th April 1900, enters the district at Kyehmôn and terminates at Alôn, eighteen miles to the north. The intermediate stations are Mônywa and Nandaw, one mile south of Alôn. The only bridge of importance within the district is over the Thazi or Obodaung stream, six miles north of Mônywa. It was originally constructed of one span of 60 feet and six spans of 40 feet, with iron girders. The approaches were, however, washed away by floods in 1900-01 and two additional spans of 40 feet were put in. The original estimate for the Sagaing-Alôn section of line was at the rate of Rs. 53,624 per mile. Breaches of the line—usually following on heavy late rains in October—have been frequent, and in 1905-06 the section was breached three times, interruptions to traffic extending over ten weeks. Within the district, the section most exposed to the risk of breaching is between Kyehmôn and Mônywa stations.

The amount of goods traffic carried has been shown in Chapter VI. There is at the present time a service of one mixed goods and passenger train up, and one down in the day, in the cold-weather months, when the harvest is being moved, an occasional extra goods train is run.

The Chindwin. Apart from the railway, the chief artery of communication is the Chindwin. There is a weekly service of small Government launches in each direction, running between Mandalay and Kindat in the Upper Chindwin district. These carry only Government stores and servants.

The Irrawaddy Flotilla Company maintain a service on the Chindwin. Their first steamer was placed on the river in 1882, three years before annexation. It was the stern-wheeler *Kahbyoo*, one hundred and seventy feet in length. This vessel was found to be unsuitable for the low-water season and was withdrawn, being replaced for a short time

by smaller paddle-steamers. As trade developed paddle-steamers gave way to stern-wheelers, and the present fleet consists of six steamers of this type, which provide a weekly service up and down stream between Pakôkku and Kindat, an additional weekly service between Mônywa and Kindat, and an additional bi-weekly service between Mônywa and Pakôkku.

Fuel is collected for the steamers, both of the Company and of Government, at wood depôts situated at Mônywa, Aingdaing above Shwezayè, Kani, Kanè, and Ôkma below Yin.

The Chindwin is buoyed, snags are removed and blasting operations carried out by Government. The only rocky ford in the portion of the Chindwin falling within the district is at Alôn, but between the Sagaing and Lower Chindwin shores at the southern boundary of the district, near Amyin, there are dangerous rocks. In low water launches are liable to run aground. The conditions of the river—especially the narrowness of the channel in places—make it impracticable to employ large steamers. and the bulk of the trade is carried in country-boats, *vide* Chapter VI. None of the tributaries of the Chindwin is navigable even for the smallest boats.

The Mu. The Mu is navigable for country-boats of some size for four or five months in the year. The level of the water below the Shwebo canal weir has, however, fallen, and will fall further when the Ye-u canal is completed. There is no service of steamers on the Mu.

Ferries. There are ferries at the following places, from south to north:—

On the Chindwin—Hnawkado, opposite Amyin in the Sagaing district; Satôn; Tagundaing and Ywathit, south of Mônywa; the Hlègu quarter of Mônywa; Gwegyi, between Mônywa and Alôn; Mindaung and Kaing near Alôn; Natlabo, south of Shwezayè; Natgyi; and Bônmazin, south of Kin.

On the Mu—Sindalè, Zayit, and Aungtha

The Deputy Commissioner of the Chindwin—the single charge which was later divided into the two Chindwins—reported in 1887 that there was not a single road, *i.e.*, one passable at all times of the year, in the district. Communications by land are now fair on the east of the Chindwin, and generally poor on the west, where the black-soil areas are more extensive and the rainfall is greater. There is a programme of road projects, which is revised from time to

time, as circumstances change. Roads in existence are classified, the highest class comprising metalled roads bridged and drained throughout, and the lowest simple, cleared tracks. The higher classes are, with one exception, maintained by the Public Works Department from Provincial Funds. Lower classes are maintained by the District Fund. Petty repairs to village roads are sometimes carried out without payment by the people, on whom rests a contingent legal liability to keep tracks open from village to village.

Public Works Department roads.

The following tabulated statement shows the different roads and the portions metalled :—

Name of Road.	Length metalled in miles.	Length un-metalled, in miles.	Total length.	Bungalows at
1. Mônywa-Ye-u, in Shwebo district.	8	24⅛	32⅛	Hpanga-gyin, Budalin.
2. Mônywa-Myinmu, in Sagaing district.	1	10	11	Kyehmôn.
3. Mônywa to Magyizauk	10	26	36	Kyaukka, Ayadaw.
4. Salôn-Kyadet ..	9	8¼	17¼	Salingyi, Kyadet.
5. Salingyi-Lè-ngauk .	3⅜	9	12⅜	... ..
6. Budalin-Kudaw ..	8½	3¾	12¼	Kudaw.
7. Tadaw, opposite Mônywa- Yinmabin.	15½	...	15½	Tadaw, Yinmabin.
8. Palè-Yinmabin ...	...	11	11	Lé-ngauk.
Total ...	55⅜	92⅛	147½	

1. *Mônywa-Ye-u Road.*—This road passes through Alôn, the terminus of the branch line of railway from Sagaing. An avenue of trees has been planted from mile 1 to mile 5.

2. *Mônywa-Myinmu Road.*—This section within the district is from Mônywa to Mônywe.

3. *Mônywa-Magyizauk Road.*—This road passes through Kyaukka and Ayadaw. The section from Mônywa to Kyaukka is metalled. An avenue of trees has been planted from mile 1 to mile 3.

6. ***Budalin-Kudaw Road.***—The road was commenced, as a famine relief work in 1891-92.

8. *Palè-Yinmabin Road.*—The section from Lè-ngauk to Palè, a distance of seven and a half miles, is impassable during the rains, as the road traverses black soil and is neither embanked nor metalled.

The majority of the Public Works roads pass over low ground and, as funds have admitted, embankments have been thrown up raising them above flood level. Where the ground is low-lying, the soil is generally black, and the embankments have to be formed of this soil, as the cost of carriage of other soil is prohibitive. A road so constructed, if without surface consolidation of some other material, is a mere morass in and after rain, and all but impassable for cart traffic. The wheels sink deeply into the soil, and every hundred yards or so require to be cleared of their accumulations of mud, and the strain on the draught-cattle is very severe. Consolidating stone metal over the surface was tried, but without satisfactory results, as it was found that the stone worked loose by sinking into the soil. For the last two years the road surface over this black soil has been treated with sand, and the results so far are said to have been satisfactory; the sand works into the black soil and forms a good road material.

The official Road Programme suggests that the authorities recognize the advisability of opening out first the fertile tracts in Salingyi and Palè, and it is in them that funds can no doubt be most advantageously expended. The following suggestions for improvements east of the river have been made:—

(*a*) Raising the class of the road south from Ayadaw in Settlement Tract VI. This is the road along which the cotton is carted to Myinmu.

(*b*) Constructing a metalled road south-east from Mônywa to the villages between the railway line and the Kyaukka hills. The villages are large and the country is closely populated.

(*c*) Raising the class of the existing road between Budalin and Nyaunggan and, in continuation,

(*d*) Improving the existing road from Alôn along the river bank to Lemye, and thence north-east to Nyaunggan. This road skirts the black-soil Tract V, which cannot be traversed in the rainy months.

(*e*) Making a permanent cart-road from Nyaungbyubin to the Mônywa-Myinmu road, in order to open up Tract II in the rains.

(*f*) Raising the class of the Kyaukka-Indaing road, and continuing it to Thazi.

(*g*) Constructing a road north and south to connect the riverine villages on the Mu, and to continue to Myinmu in Sagaing district.

West of the Chindwin the following improvements have been suggested:—

(*a*) Making a cart-road into the Sèywa (Tract XXI). The road would be expensive to make and maintain, but the tract is traversed by a perennial stream which could produce two rice crops. At present the export of unhusked rice is impracticable, and the price does not exceed fifty rupees for one hundred baskets.

(*b*) North of Kani there is no cart-road along either bank of the Chindwin, except for a short section south of Yin, and, as rocks come down in places to the water's edge, it is possible that the cost of constructing a marginal road would be prohibitive, but the practicability of constructing a road between Kani and Mèdin has been suggested.

(*c*) Improving the existing track between Kabaing in Tract XVI and Yinbaungdaing on the Yama. The sesamum from the north-west of the Kani township comes by this route into Salingyi.

(*d*) Making a permanent cart-road north and south through Kyinin in Tract XIV to the existing roads.

(*e*) Raising the class of the unmetalled section of the Salingyi-Ywashé road.

(*f*) Constructing a new road from Sônda on the Salingyi-Kyadet road to Taya, raising the class of the existing road from Taya to Linzagyet and constructing a new road on to the Chindwin at Ngakôn.

(*g*) Raising the class of the road between Mintaingbin and Chinbyit.

(*h*) Raising the class of the road between Paunggada and Satôn.

(*i*) Raising the class of the Yinmabin-Kônywa road. The traffic is considerable.

(*j*) Raising the class of the Yinmabin-Pyanhlè road.

Road bridges. The road bridges in the district were, until recently, constructed entirely of timber, but the present policy is to replace timber abutments by abutments of dry-stone masonry. Several have been completed.

Expenditure. The annual expenditure on roads which varies with the amount that can be spared for the district from Provincial revenues, has averaged Rs. 60,000 in the past four years. New works have absorbed an average of Rs. 12,000 of the grant.

District Fund roads. The chief roads maintained by the District Fund are:—(1) Palè to Mintaingbin; (2) Salingyi to Ywashe, opposite Mônywa; (3) Kani to Nyaungbintha, north of Yinmabin; (4) Mônywa to Thazi; (5) Salingyi to Paungwa; (6) Kudaw to Yèdwet; (7) Kanè south-east to Thakuttanè; (8) Budalin to Lemye; (9) Budalin north-west to Payagyi near Thakuttanè; (10) Budalin court-house to Budalin village; (11) Alôn to Lemye; (12) Kyaukka to Indaing; (13) Yinmabin to Kônywa; (14) Yinmabin to Pyanhlè; (15) Kani south to Thityaung; (16) Chinbyit to Zeiktaung. The total length of these roads is 163 miles. All have been raised above the *simple, cleared track* stage. Number 10, the small section connecting the Budalin court-house and village, is metalled, bridged and drained. None of the others is metalled. The road from Palè to Mintaingbin, number 1, is bridged and drained throughout; all the others are only partially bridged and drained. The expenditure incurred by the District Fund on roads in recent years has been as follows:—

		Rs.			Rs.
1905-06	...	2,433	1907-08	...	1,597
1906-07	...	17,359	1908-09	...	4,898

Village roads. Besides the roads supervised by the Public Works Department and the District Fund, there are in all parts of the district simple, cleared, hundred-foot tracks, petty repairs to which are sometimes carried out by the people without payment. These had an aggregate length of 384 miles in 1905-06. Where they traverse high-lying, red-soil regions they are open throughout the year.

Communications within the forests have been described in Chapter V.

CHAPTER VIII.—Famine.

Rainfall. The average rainfall over all years for which records existed up to 1906, was as follows: for the sake of comparison the rainfall at two stations in adjoining districts has been included; the order of the stations is from east to west :—

	Inches.
Saingbyin, in Shwebo district, north-east of Budalin.	29·29
Budalin	31·09
Mônywa	27·17
Salingyi	25·82
Palè	32·11
Kani	37·99
Mingin, in the Upper Chindwin district, in about the same latitude as the most northerly point of the Lower Chindwin district.	50·00
Zeiktaung	53·90

The Salingyi record is for a single year. The Zeiktaung record was taken for two years only, but as the average figure agrees with Mingin, which is in approximately the same longitude and similarly situated near hills, the average of the two years is no doubt an accurate indication. The rainfall varies inversely with the distance from the hills on the west and north. Thus it increases steadily from Mônywa (27) and Salingyi (25) through Palè (32) to the Pôndaung range, underneath which lies Zeiktaung (53); and through Kani (37) and Mingin (50) to Kindat (70). Although a rule can be observed in the averages, the variation from year to year is very great, the recorded extremes at Mônywa being 16 and 40, Budalin 20 and 48, Palè 24 and 44, and Kani 26 and 53. Not only is the variation very great, but the fall is local. Thus the four stations mentioned have recorded their highest rainfall each in a different year, and their lowest each in a different year.

Examination of the popular belief that the rainfall is diminishing. The unanimous opinion of the people is that the rainfall is getting worse. It is often stated that the actual fall is diminishing; it is almost invariably stated that it is more capricious and undependable than it used to be. The people sometimes ascribe the supposed deterioration to the fact that the world is now in a declining cycle of the Buddhist cosmogony, or to a general falling away in religious feeling

Grouping the yearly figures by periods of years the resulting averages are:—

Year.	Average Annual Rainfall, in Inches.			
	Mônywa.	Palè.	Budalin.	Kani.
1893 to 1897 ...	28·38	31·40 (four years only).	29·67 (four years only).	...
1898 to 1902 ...	26·37	33·21	29·00	37·46
1903 to 1907 ...	28·74	31·57	34·30	37·60

There is therefore no indication in the figures that the amount of the rainfall is decreasing.

As regards the charge of greater capriciousness, the number of rainy days in each year, abstracted similarly by periods of five years and averaged to an annual figure, has been as follows:—

Years	Mônywa.			Budalin.			Pale.			Kani.		
	May to October.	Remaining months of the year.	Total.	May to October	Remaining months of the year.	Total.	May to October.	Remaining months of the year.	Total.	May to October.	Remaining months of the year.	Total.
	*	*	*	†	†	†	†	†	†			
Up to 1897 ...	38·7	6·8	44·5	38·0	5·7	43·7	39·7	6·5	46·2	...	...	...
1898 to 1902 ...	42·4	3·4	45·8	39·8	8·2	48·0	46·4	4·0	50·4	46·8	3·6	50·4
1903 to 1907 ...	38·4	5·0	43·4	39·2	6·8	46·0	41·0	4·6	45·6	38·8	6·2	45·0

* Average of seven years. † Average of four years.

The period for which figures exist is short, but they do not suggest that there has been either diminution in the number of rainy days in the whole year, or that change in the seasonal distribution is taking place.

The dry zone in the eighteenth century. Sangermano.

It is possible to compare the aspect of the dry zone more than a century ago with the aspect it presents to-day. The Italian missionary Sangermano was in Burma from 1783 to 1808, and writes thus of the climate of Ava, which is part of the dry zone:—

"The kingdom of Ava, although situated more to the north than Pegu, is nevertheless subject to the greatest and longest heats. * * * * In Ava, after a little rain that falls in May, and there are some years when even this does not come, the south-west wind carries away all the clouds. * * * * * After a little rain, which falls in May and the beginning of June, and which is called the first rain, two months and a half pass over without any more in the kingdom of Ava. But from the middle of August to the beginning of October, what are called the second rains fall, but not always in the same abundance. * * * * * * * . It sometimes happens that these second do not come at all, or are not sufficiently plentiful, and then a great scarcity is always the consequence. * * * * Nor are the inhabitants of the latter kingdom [Ava] entirely devoid of resources when the rice crop fails * * * They will also mix with what rice they have * * * wild fruits and the roots of different trees steeped and afterwards boiled in water." The account coincides closely with the circumstances of the present day.

Symes.

Symes, in his *Embassy to Ava*, describes the neighbourhood of the Irrawaddy thus. The date of his journey was July 1795:—

"Silla-mew [Salè in the Myingyan district] * * * * * * In the evening we brought to near Keahoh, a poor village, where the inhabitants get their livelihood by extracting molasses from the palmyra tree.

* * * * *

"The land about Pagan scarcely yields sufficient vegetation to nourish goats. [Volume I, Chapter II†.]

* * * * *

"The grounds [Sameikkôn in Myingyan] in the neighbourhood were embanked for the cultivation of rice. The soil appeared to be good, but the inhabitants expressed the utmost anxiety on the subject of rain. Not a drop had yet fallen here, although, in the common course of seasons, the monsoon should have commenced three weeks earlier. The poor people were carefully husbanding their rice straw for

† Constable's Miscellany Edition, 1827.

the support of their cattle, large herds of which were endeavouring to pick up a subsistence from the parched blades of grass in fields that were covered with dust instead of verdure. The appearance of these animals bespoke excessive poverty, if not actual famine.

* * * * *

"Notwithstanding the drought in the champaign country [Ava in Sagaing] had been greater this year than usual, the river was swollen to its regular height which, I was informed, it rarely fell short of, or exceeded. Indeed, this part of the country is seldom refreshed by copious rains, but, like Egypt, depends on the overflowing of its river to fertilize the soil." [Volume II, Chapter I.]

The description might have been written of the dry zone of the present day in a year in which the early rains are long delayed, and it seems probable that so far as external aspect goes, the dry zone is much the same as it has been for a century. So far as the Lower Chindwin district is concerned, it must also be remembered that there has been great extension of cultivation since annexation; it is the higher-lying, worse soils which are now coming under the plough: it is these soils on which the crops first fail; and it is clear that, given a year of equally bad rainfall now and twenty years ago, the proportion of the failed to the sown area must be greater now than in the earlier year, simply because there is now a greater proportion of the poor soils under cultivation. Hence in a year of bad rainfall, the volume of complaints is greater than it would have been in a similar year before annexation. The voice of the people, by itself, cannot be regarded as proof of a diminishing rainfall.

Indications of a diminished water-supply.

There are, however, other indications, not of a diminishing fall, but of diminished utility in a fall which may be admitted to be constant. They are: (*a*) the existence—not only under the hills in places where waste is abundant, population scanty, and the climate unhealthy, but in the most thickly-peopled and the healthiest tracts—of stretches of abandoned rice fields; (*b*) the fact that, although there has been since annexation a steady and rapid increase in population and great expansion in the area under cultivation, there has been little embanking of new rice lands: the people, in fact, sometimes say that the tendency is in the opposite direction, namely, to level down the old field-embankments; (*c*) the substitution in recent years of short-lived staples, of which the chief instance is the

seventy-five day variety of late sesamum; (*d*) the abandonment in the west of the cultivation of upland rice for the ordinary dry-crop cycle of millet and sesamum.

With regard to (*a*), a Burman would not—at any rate in the less remote tracts—give up trying to raise a rice crop on a field already embanked for that form of cultivation, unless he felt quite sure that the attempt to secure a crop would be fruitless. The fields once won a rice crop, and it appears certain that they must once have had more water than they can now count upon. With regard to (*b*), much of the land which was brought under the plough soon after annexation is in the south-west of the district, where the soil is black clay, of excellent quality for the growth of rice, and almost level, so that the minimum of labour would be needed to embank it. In other tracts, again, some of the new land lies in natural depressions, which would lend themselves to the process of embanking. Rice is the favourite food-grain of the Burman, and the cultivator is prepared to undergo toilsome labour, not one year but every year, if he thinks that there is a chance of reaping a rice crop at the end. It is difficult to account for the absence of new rice land except by admitting a deficiency in the supply of water available for cultivation. With regard to (*c*), the shorter-lived variety of sesamum is rather more expensive to plant, and a little less lucrative than the longer-aged crop. With regard to (*d*), the upland rice cycle (one or two years rice, one year sesamum, five or six years fallow) calls for a large area of land and pressure of population is contributing to diminish that form of cultivation, but the people also adduce decreasing rainfall as a reason.

The causes assignable.

Taking all the facts into consideration, it is difficult to escape the conclusion that the available water-supply is less than it used to be, and that the reason lies in the denudation of forest growth. Chapter IV contains figures showing the increase of cultivation and, although the figures for the early years are estimates, there is no doubt that there has been great extension To the west of Taya, in the angle of the Chindwin and the South Yama, there was, until after the annexation, tree-jungle in which roamed herds of elephant. Now, on that side of the river, there is no herd within fifty miles, and cultivation stretches with hardly a break to the foot of the Pagyi hills. Similar accounts of the expansion of cultivation are given in most parts of the district. In many places firewood and house-posts, which were in Burmese times cut in the village waste,

have now to be brought from distant forests. The *tari* palm has no doubt largely contributed to the denudation. No early figures are available, but the figures of the present day are enormous, *vide* Chapter IV, and the drain on the tree growth for fuel must be great. There are many places where climbing is said to have increased since annexation. The Burmese authorities did not favour the cultivation of the tree, since it provided the people with facilities for drunkenness.

Erosion.

The process of erosion has accompanied denudation of tree-growth; many of the hill torrents come down in flood rapidly, noticeable examples being the streams flowing west from Kyaukka hill, and the streams in the neighbourhood of Bôksu, south of Salingyi; in both places there has been extensive clearing of tree-growth on the upper levels. The preservation of tree-growth in the interests of the rainfall in the dry zone generally, is, it is believed, under the consideration of Government. No land in this district has, up to the present time, been reserved for purposes of rain protection, and there has been no experiment of controlling the upper courses of streams.

The practice of terracing.

In the Lower Chindwin district denudation has perhaps not gone so far as in some other of the dry-zone districts, and the practice of terracing dry-crop fields in order to catch the silt from the fields above and to prevent good soil from being washed away, although carried out to a small extent in many of the red-soil tracts, does not yet occur on a large scale.

Tracts less exposed to the risk of extensive crop failure.

Certain portions of the district are exposed to the risk of widespread crop failure. The history of the seasons since annexation proves this, and it is indicated in the figures of recent years, showing the caprice of the rainfall. The regions which are least liable to crop failure are the western tracts under the high hills, which enjoy a better rainfall, though years of failure of rainfall are not unknown, even there; the extensive plain of black soil in the south-west which, besides deriving a slightly higher rainfall from propinquity to the hills, is rendered more secure by the cool, moisture-retaining nature of the soil; the areas irrigated from the larger torrents, namely, the two Yamas; the riverine tracts south of Mônywa along either side of the Chindwin, which may—in perhaps one year in six—fail to receive inundation, but which can, in such a year, grow a spring-ripening crop of beans of many kinds; the country north of Kani, where the rainfall is better; the valley between the railway line and the Kyaukka ridge, which

receives silt deposit from torrents; the eastern black-soil region; and the small areas which are irrigated from artesian wells and natural springs. Excluding these areas, there remains much more than half of the district exposed to the possibility of crop failure, though the degree of risk varies.

History of the seasons since annexation.

Some idea of the expectation of the seasons may be gathered from an examination of the nature of the years since annexation. They are shown in the following abstract, in which a grade has been assigned to each year on an examination of the remarks contained in the Revenue Administration and Crop and Season Reports:—

Year.	Agricultural quality.
1888-89	Middling.
1889-90	Rainfall above the average; good.
1890-91	Rainfall much below the average; bad.
1891-92	Rainfall much below the average, and said to have been the lowest for thirty years; bad.
1892-93	Rainfall good in most parts; middling.
1893-94	Rainfall fair, but the late rains failed; middling.
1894-95	Rainfall good; good.
1895-96	Rainfall poor; bad.
1896-97	Rainfall poor; bad.
1897-98	Rainfall fair and timely; good.
1898-99	Rainfall good, but failed towards the end of the season; middling
1899-1900	Rainfall good; good
1900-01	Rainfall untimely; middling.
1901-02	Rainfall untimely and insufficient: early long drought; middling.
1902-03	Rainfall untimely and insufficient; early rain favourable, but followed by prolonged drought; middling.
1903-04	Early rains bad, late rains exceptionally good; good.
1904-05	Rainfall above the average and well distributed; good.
1905-06	Rainfall badly distributed; middling.
1906-07	Rainfall fair and well distributed, but no late rain fell; middling.
1907-08	Rainfall very bad; widespread crop failure; bad.
1908-09	Early rains bad, late rains good; good.

Out of the twenty-one years, seven are classified as good, five as bad, and nine as middling. In the last eleven years only one year falls within the 'bad' category, and there are four good years. This cannot, however, be taken as indicating an improvement in the seasons. Before

the construction of the railway, local scarcity could not to the same extent be remedied by emigration; some of the early years were no doubt on this account officially reported as middling, which would be regarded as good at the present time, when sporadic crop failure is of less importance. It may be stated that, on the average, out of three years one may be expected to be good, one bad and one middling.

The years of pronounced scarcity have been as follows:—In 1890-91, in parts of the north and north-west of the district, scarcity was imminent and, in the Sèywa and Shitywa glens in the extreme west, actually occurred. The *thathameda* tax was reduced from ten rupees per household to five and four in the affected areas, which were not, however, extensive, and it is an illustration of the rapidity with which population returned after the troubled times of the annexation that the collections from the tax rose for the whole district. **Seasons of pronounced scarcity: 1890-91.**

The succeeding year, was much worse. The Western subdivision (now the Salingyi and Palè townships) secured average crops, but elsewhere both early and late crops were bad. The bad harvest of the year before had depleted supplies of grain. Distress became acute in the Eastern (now the Mônywa) subdivision. Conditions were worst on the Kyaukka plateau and in the region to the north-west, as far as the Inbaung. It was estimated at the beginning of December 1891 that relief would be required in the Ayadaw township for 3,281 persons for eight months, at a cost of Rs. 1,44,000. Relief works were opened in September and October 1891, and closed in July 1892. The cost of the operations in the townships of the Eastern subdivision was—Kudaw, Rs. 50,752; Ayadaw, Rs. 34,492; Kani, Rs. 3,(03; Mônywa, Rs. 678; in all, Rs. 89,825; and, of the original demand from the household tax, a sum of Rs. 95,474 was remitted. The Financial Commissioner had sanctioned as famine wage—in order to prevent emigration, which the authorities then regarded as undesirable—6 annas for a man, 4 annas for a woman, and 2 annas for a child. On the 28th September 1891, instructions were received to reduce the rates to annas 4, 2, and 1 respectively. These were apparently the rates for daily labour. In January 1892 women and children were being paid on piece-work at rates which enabled women to earn 2 annas and children 1 anna *per diem*. The piece-rate for men was apparently 2½ annas. **1891-92.**

A proposal was made to raise the rates to 2½ and 1½ annas for women and children respectively, but was rejected by the Financial Commissioner. On the 7th April 1892, the Deputy Commissioner reported that men would not work for 2½ annas, and requested sanction to restore the old, higher rates, subject to the proviso that a man should not receive more than 4 annas. The labourers on the Tapôn tank in the Inbaung were at the time asking 10 annas for a task of 100 cubic feet of earthwork with a 100-foot lead, and, for daily wages, 8 annas and 4 annas for a man and woman respectively. The proposal to raise the rates was not sanctioned, as a fresh scale of general rates came into force almost immediately (*Chief Commissioner's Resolution* 1S-2, 1892, *dated the* 14*th April* 1892). The average cost of the maximum Code ration was stated in the Resolution to be annas 2½, 2⅛ and 1⅜ for a man, a woman, and a child, respectively; the standard daily task of a B (agricultural) family, of husband and wife with two children, was estimated at 100 cubic feet, and the piece-rate for such a family was estimated at 9 annas for that amount of earthwork. These rates were introduced on the 24th April, and the people remained on the works in Budalin, but not at Tapôn. On the 7th of June, orders were issued to close operations as the works in hand became completed. No death took place from starvation. A population of 30,000 was affected by this famine. The highest daily attendance on the work was 4,332 persons, and the units relieved from the beginning to the end of the period of scarcity numbered 362,866.

1895-96; 1896-97. The same region was affected in 1895-96, when remissions of the *thathameda* tax were required; and again in the succeeding year, when the initial demand of the tax fell by R. 18,000, and there were also remissions amounting to Rs. 16,000.

1903-04. At the end of July 1903 there were reports of impending scarcity from the rice-growing region east of Kudaw and the upland villages between Kudaw and Natyedaung, which grow dry crops for the most part. A test work, the embankment of the Kudaw-Winmana road, was opened near Kudaw on the 30th August. The numbers on the work were:—30th August, 847; 31st, 1,117; 1st September, 1907; 2nd, 2,278; 3rd, 2,450. On the 3rd there was rain in the west, and some villages left the work. On the 6th and 7th there was general rain, and about 2,000 persons left, in order to resume agricultural operations. The work was closed on the 9th. The wage for an adult male performing

a full task appears to have been fixed at the low rate of one anna seven pies, and rice was selling on the work at Rs. 3-9-0 per local basket of about 55 pounds. The wage was small, but there were few tools and overseers available, it is not clear that tasks were measured, and it cannot be stated that a full task was taken The practical desertion of the work after one or two days' rain showed that the people were not destitute. The work was in fact no real test of the existence of famine, since the agricultural season had not yet gone by, and the people can always maintain themselves until the sowing rains. They appear to have come to the work, not because they would have starved otherwise, but because it suited them to obtain a small wage for a task which was no doubt not rigorously set, rather than eke out their food with roots gathered in the jungle until such time as the sowing rains fell.

One of the worst years within memory was 1907-08. All the late crops failed generally. Relief works were suggested, but were not required and were not started. Emigration was encouraged, and Rs 1,33,000 of the *thathameda* demand remitted This did not represent the full measure of relief afforded. Whereas, in earlier years of widespread failure, the household tax was practically the single form of taxation, in 1907-08 the district was under a Summary Settlement and subject to the payment of Land Revenue, and land is not assessed at all if less than one-fourth of an average crop is gained from it. The land revenue demand fell from Rs. 3,01,074 in 1906-07 to Rs. 2,16,091 in 1907-08. The parts of the district affected were again the red-soil tracts between the Mu river and the Kyaukka divide. They lie about midway between the Shan hills in the east and the Chin hills in the west, and the history of the years of scarcity shows that they, with the tract to the north-west, are the regions most likely to be implicated. **1907-08.**

It is to be anticipated that failure of crops will occur in the future at least as frequently as it has occurred in the past: probably more frequently, since the higher-lying precarious soils are those which are now coming under cultivation, and the denudation of tree growth appears to be diminishing the utility of the rainfall. The year 1907-08 made it clear, however, that widespread crop failure need not necessarily be accompanied by famine conditions. The people are not impoverished; in an earlier chapter it has been noticed that there is nearly one head of cattle to each soul of the population; most of the land is held in **Improbability of famine conditions arising.**

private ownership, on what is practically a full freehold tenure, and in small estates: land has considerable value in exchange. There are no caste restrictions operating to confine industry to a particular form or to impede travel; emigration is easy, and the people do not shrink from emigrating temporarily. Given the usual bounteous rice harvest in Lower Burma, there will be a steady demand for agricultural labour, and the labour of the Upper Burman is preferred to that of the Indian cooly. Hence, in a bad year, the cultivator whose crops have failed has many ways of tiding over the months before the next season opens; he may sell a bullock, mortgage his land, send his sons down to Lower Burma, or emigrate himself. So long as these favourable conditions exist, there is little likelihood of famine conditions, as the term is understood in peninsular India, arising.

There is, however, a sanctioned scheme of projects to be taken in hand in the event of a famine, and the existing list of Public Relief Works includes the improvement or construction of numerous tanks for the supply of drinking, water

Policy of suspension of revenue demand not followed. The policy of temporary suspension of the revenue demand in a year of failure of crops, the arrears being collected subsequently, has not been applied in this district. So far as the land-revenue demand is concerned, since the matured crop only is assessable, arrears cannot accrue on a crop-failed field. Temporary reductions of the rate of the household tax have been sanctioned occasionally on account of unfavourable agricultural conditions, and remissions of land revenue are granted for a short crop, but such abatements have hitherto been final: the remitted portion has not been demanded in the following year. The rapid recuperation of the district after years of agricultural calamity is exemplified in the paragraph dealing with gross revenue collections in Chapter X, and suggests that the existing policy is well suited to a district most of which falls within the dry zone.

Substitutes for the ordinary food-grains in times of scarcity. The absence of caste restrictions affecting his diet, and his lack of fastidiousness as to the food he eats also help the Burman when the food-crops fail. The following roots and plants are eaten in times of scarcity:—

Pe-u (corypha umbraculifera), the palmyra palm. The tree is felled and the pith extracted, sundried, pounded to powder, baked and eaten. The powder is also boiled in water to a thick mass, and eaten thus. The diet is said to cause diarrhœa.

Thindauk-u, a root; it is boiled and eaten mixed with sesamum-oil and salt. The diet is said to be wholesome, but it causes an irritating rash.

Kywè-u (dioscorea dæmona). The root is sliced, steeped in water for three days, compressed, usually by treading, sundried, and eaten boiled or baked, along with palm sugar. The food is wholesome, if properly prepared; otherwise it causes giddiness.

Môndaing-u or *madaing-u*, the root of the *môndaing* (cycas), a kind of small tree-fern. The root is sliced and steeped in water for at least twelve days; it is then compressed, sundried, baked with palm-sugar and eaten. The food is wholesome, if properly prepared; otherwise it is said to cause death.

Kyi-che-u; this root is pounded to powder, mixed with water, and baked. It is said to be wholesome.

Wa-u, a tuber. It is sliced, washed, sundried, pounded, and steamed, and eaten mixed with salt or palm-sugar. The food is poisonous unless the processes are carefully carried out.

The seed of the grass known as *wunbèsa* (panicum crus galli) is occasionally used as a substitute for the ordinary grains. The seed is pounded and the grain cooked like rice, and it is said to be more palatable than millet.

Wild yams of several kinds are used as an ordinary article of diet in the rainy tracts under the western hills.

Local division of the rainy season.

The people divide the rains into three periods: the early rains of May and June, the middle rains of August and September, and the late rains of October and, in occasional years, the beginning of November. The early rains are of value, since they cool the soil, soften it for the ploughing later and provide grazing, but they are not much utilized for sowing except in the west, where early sesamum is grown, and on the Kyaukka plateau, where cotton and green bean, *pèdi*, are cultivated. When these rains fail or when, after sowing, there is—and this frequently happens—a prolonged break which withers the young plants, the cultivator, after the fashion of farmers all the world over, grumbles loudly. But early sesamum, profitable as it is if it succeeds, is a catch crop only. Land sown with early sesamum can always take a second crop, of beans or late sesamum or millet; and cotton and *pèdi* cover a small area on the whole. The early rains are therefore not critical rains. Nor are the middle rains critical, for there is always a fall sufficient to make sowings practicable. It is the late rains of October which are the critical rains. If these fail

altogether, or if the interval between the general sowings and the occurrence of the late rain is so great that the plants wither, the main harvest has perished. The spring-ripening crop of wheat and beans is of minor importance, and abundant late rain cannot save the situation if it falls too late to revive the fields of rice and millet and sesamum.

CHAPTER IX.—Administration, General and Judicial, Public Works, etc.

[The paragraphs dealing with the Civil Police compiled from material supplied by Mr. J. H. Leggett, Officiating District Superintendent of Police, Lower Chindwin District; those dealing with the Military Police compiled from material supplied by Captain A. B. Merriman, I.A., Officiating Commandant, Chindwin Battalion.]

For a detailed description of the officers forming and the methods followed by the central Burmese administration and of the judicial procedure obtaining in late Burmese times, reference may be made to the *British Burma Gazetteer* and the *Upper Burma Gazetteer*, Chapter XVI.

Burmese administrative divisions within the district.

The Burmese *nè*, or Governorships, which fell within the present Lower Chindwin district were:—

(a) *Alôn*; bounded on the north by the Governorships of Kani and Tabayin (now in Shwebo district); on the east by the Mu river; on the south by the Amyin Governorship (now in Sagaing); and on the west by the Chindwin. Its boundaries correspond approximately with those of the existing Mônywa and Budalin townships. The officials were:—

	Rs.
A *wun*, or Governor, remunerated by a salary of	200 [300?]
Two *sitkè*, subordinate judicial officers, each with a salary of	100
Two *nakhan* } officials with clerical duties {	65
Two *myosa-ye* } officials with clerical duties {	50
Six *yazawut-ôk*	50
One *kunbodein-wun*	30
One *kinôk*.	
One *myothu-gyi*.	
Sixty-six *ywathu-gyis*.	

All were appointed by the king. The civil jurisdiction of the Alôn *wun* is said to have been limited in Thibaw's time to suits not exceeding Rs. 1,000 in value. *Yazawut-ôk* were police magistrates, with some additional civil power of small extent. The *kunbodein-wun* supervised those heads of revenue which under existing classification would be

ascribed to Law and Justice. The *kinók* was the Royal lessee, to whom the exclusive right of collecting certain classes of revenue had been sold by auction.

(b) *Kani.*—Its boundaries were : on the south, the North Yama stream ; on the west the Pôndaung range of hills ; on the north the Khampat Governorship, which had its head-quarters at Kindat, now in the Upper Chindwin district ; on the east, the Tabayin Governorship, the Alôn Governorship, and the Chindwin. The officials were : a *wun*, two *sitkè*, two *myosa-ye*, one *myotnugyi*, and 98 *ywathugyi*. The charge included, besides the existing Kani township, five village groups now in the Mingin subdivision of the Upper Chindwin, namely, Bin, Thindaw, Singa-le, Thanbauk, and Tôn ; the eight villages of the Shit-ywa valley in the south-west ; and the Shwezayè village group east of the Chindwin.

(c) *Pa-gyi* (Bangyi) was bounded on the west by the Pôndaung, on the north by the Shitywa villages of the Kani *nè* and the North Yama ; on the east by the Kyaukmyet group of boat villages and by a tongue of the Amyin Governorship, and on the south by the South Yama. It comprised the country which is now the Salingyi and Palè townships, less (i) the Shitywa villages, (ii) the Kyaukmyet group, and (iii) the riverine villages between Letpadaung and Ngakôn. The officials were : a *wun*, two *taiksa-ye*, one *myothugyi*, and a number of *ywathugyi*. The court of the *wun* and *taiksa-ye* was at Salingyi. The Governorship was known as the Pagyi *taik* or riding, and this accounts for the appellation *taiksa-ye*.

(d) *Amyin Ngamyo,** the Five Towns.—This Governorship fell for the most part within what is now the Sagaing district, but the littoral from Ngakôn at the junction of the South Yama and the Chindwin to Letpadaung opposite Mônywa and a few villages near Nyaungbyubin were part of it. The boundaries of the riverine fringe of Amyin were—on the west the Pagyi Governorship ; on the north the Kyaukmyet boat villages ; on the east the Chindwin ; and on the south the South Yama. The officials were—a *wun*, one *nahkan*, one *saye-gyi* (chief clerk), and a varying number of *myosa-ye*.

(e) *Kyaukmyet.*—This small group of villages, situated at the junction of the North Yama and the Chindwin, provided boatmen for the Royal fleet.

The extent of the authority of these officials in late

* They were Amyin, Payenma, Kyaukyit, Nabet and Allagappa, all now in the Sagaing district.

Burmese times is described in detail at page 509 of Part I, Volume II, of the *Upper Burma Gazetteer*.

Military and Marine forces in Burmese times.

The district supplied a great part of the standing army in late Burmese times, and it is therefore of interest to trace briefly the growth of Burmese military administration. Sangermano, who arrived at Ava in Upper Burma in 1783, writes:—

"The soldiery of the Burmese Empire is on a very different footing from ours. It does not consist of regiments of soldiers with various ensigns, who live separately from other members of society in barracks, castles and fortresses * * * Those who in this country perform military service are the whole Burmese nation * * * * . The population of the kingdom, which amounts to nearly two millions of souls, may be considered as divided into so many small corps, each of which has its own head who is called Sessauchi (*thwe-thaukgyi*), and corresponds to our Sergeant. * * * Each of these different corps has a Mandarin (*wun*) in the capital for protector.

"When the Emperor orders any military expedition, either into hostile countries, or against rebels, he fixes at the same time the number of soldiers who are to march, and nominates immediately the General who is to command them. The Lu'to (*hlutdaw* Central administrative office) in the capital and the Ion or Rôndai (*yôn*, the governor's office) of the provincial cities then exact from the heads of the different places under their jurisdiction, not only the number of men ordered by the Emperor, but also a certain quantity more. * * * * *
* * * * *

"As soon as the order for marching arrives, the soldiers, leaving their sowing and reaping, and whatever occupation they may be engaged in, assemble instantly in different corps, and prepare themselves."

It appears from this account that there was then no standing army in barracks at the capital, and that the obligation to serve rested on every one alike.

Symes in the *Embassy to Ava* states that every man in the kingdom was liable to military service, and war was deemed the most honourable occupation. There was a small regular military establishment at that time (1795), not exceeding the number of which the royal guard was composed, and such as were necessary to preserve the peace of the capital:—

"Infantry and cavalry compose the regular guards of

the King. The former are armed with muskets and sabres * * * * *. The infantry are not uniformly clothed. I heard various accounts of their numbers: 700 do constant duty within the precincts and at the several gates of the palace. I think that on the day of my public reception, I saw about 2,000 and have no doubt that all the troops in the city were paraded on that occasion."

There had therefore grown up, by the end of the eighteenth century, the nucleus of a standing army.

Either Symes was misinformed as to its strength or later kings largely added to it, for in 1879 it much exceeded 2,000. The *History of the Alaungpaya Dynasty*, compiled by Maung Tin, A.T.M., gives the strength in Thibaw's reign as 24,000 men.

The twelve regiments.

The Lower Chindwin district furnished the greater part, if not the whole, of the twelve regiments which composed the Inner and the Outer Brigades, of six regiments each. These regiments were stationed at the capital, and the conscript was supposed to receive monthly pay, which was ten rupees in Thibaw's reign. The pay was, in fact, intermittent, and his circle of associated families (*daing*) had to make a grant-in-aid, *nauk-htauk-gye,* of the conscript, and this averaged five rupees *per mensem.*

The Inner Brigade (*adwin-chaukso*) was composed of the following six regiments:—

Myauk Taya-nga-sè.	Taung Dawè.
Taung Taya-nga-sè	Myauk-ma-yapin.
Myauk Dawè.	Shwepyi-hmangin.

These were recruited from the Alôn Governorship. The Outer Brigade (*upyin-chaukso*) also comprised six regiments:—

Natsu Letwè.	Ywe Letya.
Natsu Letya.	Letwe-gyaung.
Ywe Letwè.	Letya-gyaung.

This is the list usually given, but there are variants, and some lists include the Shwe-hlan, Natshin-ywe, Taung Mahayapin, Daing, and Linzin regiments. The Outer Brigade was recruited from the Pagyi Governorship.

There were also minor regiments, of which the Tagani were recruited in part from the north-east of the district, and the Yun corps of lictors was recruited from certain villages between the Yamas.

The strength of the Taung Dawè regiment is said to have been—

One thousand privates (*ngè-tha* or *tattha*).
One hundred corporals (*akyat*).
Twenty sergeants (*thwe-thaukgyi*).
Two company officers (*tat-hmu*).
Two adjutants (*thenatsayè*).
One colonel (*bo*).

All the regiments were not of this strength: some were larger and some smaller.

The system of division into *daing*, or circles of households, each responsible for one member of the standing army, was not universal. The Amyin villages and the greater part of the Kani Governorship remained unorganized. They were liable for occasional service, but there was no regiment of the permanent forces recruited from these regions, and when called out for service the levies were not tattooed. The regular soldiers were tattooed with the regimental device, on the back of the neck in some cases, on the wrist or the waist in others. The unorganized tracts were known as the *thin* country, whilst the organized tracts were *eintaungzôn* (literally, household troops). How the difference arose has not been ascertained The *thin* country is not so rich as to warrant the suggestion that it bought off the liability to serve, nor is it so remote as to suggest that it was exempted on account of difficulty of control. Possibly there was an idea that the fighting quality of the Burmans in the *thin* tracts was poorer, but there is no evidence on the point. Further details of the military service will be found in the paragraphs concerning land tenures in the next chapter.

The boat villages

The district also furnished a war-boat, the contributing villages being Kyaukmyet and the villages near. The *Embassy to Ava* describes the drill of a war-boat, and the *Gazetteer of Upper Burma*, Part I, Volume I, 497 *et seq.*, contains an account of military and naval practice in the later days of Burmese rule.

Administration after annexation. Boundaries—external.

The district falls within the Sagaing (until 1896-97 the Central) administrative Division. Chindwin, as it first existed as a single district, was an enormous charge, including the whole of the valley on both sides of the Chindwin river, and extending northwards for 500 or 600 miles, until it was lost in the ranges of hills separating Burma from Assam. In February 1886 the Chindwin valley was divided into two districts, the Manipur Agent being placed in charge of the Upper part, with headquarters at Kindat,

and the Lower Chindwin forming a district under a separate Deputy Commissioner, with headquarters at Alôn. In the disturbed state of the country, effective communication between Manipur and the Chindwin proved, however, to be an impossibility, and in July the whole of the Chindwin valley was again placed under a single Deputy Commissioner. In October so much of the Amyin jurisdiction of Burmese times as lay east of the Chindwin was transferred to Sagaing. The whole of the Chindwin country remained as a single charge throughout 1887, but in January 1888 the valley was divided into the Upper Chindwin and Lower Chindwin districts. Within the Lower Chindwin district was included the Kani Governorship of Burmese times, which was, however policed by local levies and administered by the Burmese *wun* (Governor) as Township Officer until it was brought under the ordinary district administration in 1890-91.

Later changes have been of small importance. The boundary with Sagaing, both in the east along the Mu and in the west along the Bônmano stream near Nyaungbyubin, has been from time to time the subject of dispute, owing in each case to the fact that the original boundary was liable to change through river action. In 1893 several villages were transferred from Sagaing district and added to the Nyaungbyubin group, and this is the most important change in external boundaries that has taken place since the present district was formed in 1888. The present boundaries have been described in Chapter V (the western boundary) and Chapter I.

The administrative divisions up to the end of 1894 were as follows :— Internal boundaries.

Subdivisions.	Townships.	Area in square miles.
Eastern ...	Mônywa	340
	Kudaw	312
	Kani	1,736
	Ayadaw	284
Western ...	Eastern Pagyi ...	296
	Western Pagyi ...	432

The Ayadaw township included all the country between the Kyaukka ridge and the Mu; the Mônywa township was the southern, and the Kudaw township the northern, portion of the country between that ridge and the Chindwin: the Kani township—as now—bestrode the Chindwin, including practically all the country north of the North Yama on the west of the Chindwin and the Inbaung villages and the adjoining fringe of the Chindwin on the north-east. Eastern Pagyi was the eastern half of the country between the Yamas, and Western Pagyi the western half.

It was proposed in 1893 to make the Chindwin the boundary between the subdivisions, but the arrangement did not commend itself, and by a notification of the 15th November 1894 the charges were rearranged into the Budalin subdivision, with Budalin and Mônywa townships; and the Palè subdivision, with Kani, Salingyi and Mintaingbin townships. This effected the absorption of the Ayadaw township, the northern half of which fell to Budalin (formerly Kudaw) township and the southern to Mônywa township: and it transferred the Kani township intact from the Eastern to the Western subdivision. The new subdivisions were named the Budalin and Palè subdivisions. Eastern Pagyi was renamed the Salingyi, and Western Pagyi the Mintaingbin township

The existing administrative divisions are as then formed, but the names of the subdivisions have been changed from Budalin to Mônywa and from Palè to Yinmabin, and the name of the Mintaingbin township has been changed to Palè.

The District staff. The superior officers of the district staff are—one Deputy Commissioner, who is also District Judge; one Superintendent of Land Records, one Treasury Officer, who is also Headquarters Magistrate and Additional Township Judge, two Subdivisional Officers, five Township Officers, one *Akunwun*, in subordinate control of the collection of various heads of revenue, one Deputy Conservator of Forests, one Superintendent of Post Offices, one Assistant Superintendent of Telegraphs, one District Superintendent of Police, two Inspectors of Police Circles, one Commandant of Military Police, one Deputy Inspector of Schools, one Civil Surgeon, who is also Superintendent of the Jail, one Executive Engineer, and one Public Works Department Subdivisional Officer.

Village administration. There are over 1,000 hamlets, or self-contained groups of houses, in the district, and these are controlled by 671 headmen. The indigenous custom of administration, under which the headman of a village or of a group of villages was

responsible for the maintenance of order in his charge and for the collection of the revenue, is the existing policy. Now, as in Burmese times, the headman's remuneration is a percentage of his revenue collections. But whereas, in Burmese times, many of the headmen's charges comprised a large area of country and twenty or thirty villages, each under a subordinate village headman, who in many cases received no remuneration at all, the existing policy is gradually, as occasion offers—that is to say, when the headman of one of the old large circles of villages dies or is removed for fault—to rearrange the component villages in several smaller groups, and within each small group to appoint a single headman, drawing the full commission on the revenue collections. Thus one independent village headman will take the place of all the old subordinate village headmen within the new group; there will be a single remunerated official, instead of several unremunerated. The trend of policy is exhibited in the decrease in the number of headmen of large circles of villages from 127 in 1902 to 88 in 1908, and in the corresponding increase in the number of independent headmen of small groups from 152 to 239.

Remuneration. In the large groups or circles, the general rule is that the headman enjoys all the commission on the revenue collections There are two special cases. The headman of Thitgyi-daing, near Zeiktaung in the Kuhnit-ywa, besides receiving the whole of the commission from his own circle, receives one-tenth of the commission earned by the headmen of other circles and independent groups in that glen and the Shit-ywa, north of it. The arrangement dates from 1893. The headman of Tawa in the south-west of the Kani township receives, in addition to the commission on his own collections, one-third of the commission of the Letkabya headman

The number of headmen invested with civil and higher criminal powers has been—

1902	... 1	1907	... 10
1905	... 2	1908	.. 31

Little use was made of the powers until 1908, when numerous cases were tried.

Civil Justice. The Civil Courts in the district are the court of the District Judge, two courts of Subdivisional Judges, and six courts of Township Judges, one for each of the five administrative townships and one presided over by the Headquarters Magistrate of Mônywa, as Additional Township Judge. There were, at the end of 1908, 31 village headmen empowered to try civil suits of a petty nature, *vide supra*.

Growth in litigation.

The number of suits instituted in the district in each year was—beginning with 1889—300, 345, 443, 526, 565, 526, 371, 599 and, in 1897, 609. From 1898, details by courts are available and exhibit a general upward tendency. Cases instituted in the Township Courts for the ten years beginning with 1898 have numbered—410, 508, 636, 616, 777, 701, 683, 647, 963, 993. The increase in the middle period and in the concluding two years may be attributed in a degree to the Summary and Regular Settlements (1900 to 1903 and 1906 to 1909), since Settlement operations lead to the investigation of titles to land and the discovery of points of dispute as to ownership, and in recent years the winding up by *chetty* money-lenders of their businesses in Mônywa is also ascribed as a reason. In the same decennium the number of cases instituted in the Subdivisional Courts was—11, 6, 8, 56, 71, 53, 55, 61, 125, 132. The upward tendency commencing in 1901 is to be attributed partly to the Summary Settlement and partly to the fact that the trial of suits involving land was removed from the Township Courts in that year. The increase in the concluding period may be ascribed to the general causes mentioned above. Suits of high value, which require to be instituted in the Court of the District Judge, average hardly more than one in each year. The bulk of the land in the district is privately owned, and most land disputes therefore come before the Civil Courts. Out of the whole number of suits, suits for immoveable property, beginning with 1893, have numbered 120, 84, 63, 64, 111, 91 and, in 1899, 88. The large number instituted in 1893 is ascribed to the return of emigrants after pacification and the revival of dormant claims to land. From 1902 the numbers have been 44, 28, 24, 25, 53, 55 and 109, the increase in the last three years being attributed to Settlement operations. The effect of the return of emigrants in the early years and of Settlement operations in the later can also be seen in the figures of mortgage suits, which have been, from 1893 to 1899, 57, 24, 13, 6, 1, 1, 1, and from 1902, 25, 16, 18, 16, 27, 35 and 28. Applications under the Probate and Administration Act averaged 13, and applications for declaration of insolvency 5, in the six years ending with 1907. The duty and penalty realized by Civil Courts on documents not duly stamped averaged Rs. 238 for the seven years ending 1907. The figures do not suggest any general tendency.

Duration of cases.

The average duration of cases has steadily risen. From 1889 to 1899 the figures were 16 days, 16, 18, 18, 19, 15, 26, 26, 25, 32 and 34. The average duration of contested (original cases rose from 32 to 51 days in the period from

1902 to 1907, whilst the percentage of uncontested cases rose from 66·04 to 76·62.

The value of suits instituted in the courts of Township Judges shows a gradual upward tendency; the figures from 1891 to 1907 have been as follows, in rupees:—59, 59, 53, 54, 53, 47, 59, 61, 65, 60, 65, 57, 55, 50, 61, 64 and 76. The figures for the courts of Subdivisional Judges can be profitably contrasted from the year 1901 only, when land suits of small value became triable in them. They have been, in rupees, 288, 155, 266, 245, 253, 323, 3-9. **The value of suits.**

The Transfer of Property Act has never been in force in the district, and oral transfer of interests in immoveable property is permissible. The legal obligation to register executed documents transferring interests in immoveable property, however small the value of the property, has been in force in the district since the 7th January 1890, when a Registration Office was established at Mônywa under the provisions of the first Upper Burma Registration Regulation. The obligation at first extended to immoveable property situated within the limits of Mônywa Municipality only. Registration of documentary transfers of land in the rural areas was optional up to 1892-93, when optional registrations were prohibited. On the 1st January 1896, the registration of all documentary transfers of interest in land (subject to exception in the case of certain classes of documents) was made compulsory, not only in town areas, but over the greater part of Upper Burma, and this change brought the whole of the Lower Chindwin district under the operation of the law. In 1896-97, leases of house-sites by Government in Mônywa town were exempted from registration. In November 1897 a revised Upper Burma Registration Regulation (II of 1897) issued, and optional registration was again permitted in certain cases; there was no change in the law requiring all documentary transfers of immoveable property to be registered. Orders granting loans and instruments for securing the repayment of loans under the Agriculturists' Loans Act, 1884, were exempted in 1899, and security bonds relating to ferries, fisheries, and excise and opium licenses in 1904. Three more Registering Offices were created in 1897-98, at Budalin, Kani and Palè. The office at Palè has since been abolished, and one at Yinmabin opened. **Registration.**

These changes in the law and in the orders regulating the administration of the law make it difficult to draw inferences from a comparison of the number of documents registered from year to year. Beginning with 1890-91, the **Numbers of documents registered.**

numbers have been—50, 141, 101, 99, 121, 109, 162, 236, 325, 278, 1,724 (in 1900-01), 811, 708 (in 1902), 556, 444, 377, 634, 678, and 761.

The increase in 1900-01 and in the concluding three years is in part attributed to Settlement operations. The advantages of registering documentary transfers are becoming more widely realized by Burmans in the rural areas. Most registrations are, however, still effected at Mônywa, the total registrations at the three rural offices having numbered—in 1905, 150; in 1906, 269; and in 1907, 262 only.

Values of each registration. The average value of each registration is high, as the value of much of the land in the district is high. The average value of the interest in registered mortgages of immoveable property has been, beginning with 1897-98—Rs. 926, 878, 461, 232, 552 (in 1902), 295, 307, 309, 374, 338, 326. The lower range of values in recent years may be ascribed partly to the fact that until 1896 only transfers of the valuable land within Mônywa Town could be registered, and partly to a general tendency—even after the law had been extended to all rural areas—for transfers of the more valuable land near the larger villages to find their way first to the Registration Office. The smaller transactions in more distant regions are probably now being registered. There is no information as to the extent to which executed documents evade registration.

Registering establishments. The registering officers are the Treasury Officer at Mônywa, the Subdivisional Officer at Yinmabin, and the Township Officers at Budalin and Kani. The clerical work of registration is conducted by the general staff of clerks, who are remunerated out of the fees paid for registration, except at Mônywa, where there is a special registration clerk.

Civil Police administration. The Civil Police-force comprises a District Superintendent of Police; a Deputy Superintendent; two Circle Inspectors, one for each of the Magisterial subdivisions, Mônywa and Yinmabin; one Court Inspector; one Sub-Inspector at each police-station; 30 sergeants in three grades; 208 constables in three grades; two clerks, and five menials. The stations manned in the different townships in 1907 were Budalin, Kudaw, Ayadaw, Lemye, Magyizauk (Budalin); Mônywa, Alôn, Thazi, Minywa (Mônywa); Kani, Kin, Inbaung, Chaungmadaw, Kônywa (Kani); Salingyi, Yinmabin, Paungga, Kyadet (Salingyi); Palè, Mintaingbin, Zeiktaung (Palè). There is also a station of the Railway Police at Môn-ywa.

The strength rose from 229 men in 1888 to 376 in 1891, when the Kani posts were first included, and was increased, on reorganization, to 512 in 1893. In 1895 it was reduced to 391, in 1899 to 367, and it is now 298. The men are for the most part Burmans, recruited and trained in the district, but there are 17 natives of India, entertained for duty within the Mônywa Municipality. The Railway Police are a separate establishment, and are not controlled by the District Police authority.

The cost of the Police (excluding the Municipal police) was Rs. 1,17,197 in 1893, when the number on the establishment was high, and fell to Rs. 87,298 in 1903. In 1905, it rose to Rs. 1,05,281, on the introduction of the Police reorganization scheme, and fell, with reduction of the strength, to Rs. 97,190 in 1907.

Military Police: extent of command.

A Military Police Levy, called the 'Hindustani Levy'—the designation was changed to 'Chindwin Battalion' in 1887—was raised early in 1886. Its headquarters were fixed at Alôn and later, in October 1887, were moved to Mônywa. The command embraced the whole of the Chindwin valley, and the duties were in the early years purely military. In January 1888, when the Lower Chindwin district was separated off, the battalion was also divided. The command of the Lower Chindwin Battalion was confined to the district until 1891, when Sagaing district was added, the Sagaing Battalion being absorbed. The Ye-u district was added in 1893, and Shwebo in 1894; in 1895 the Ye-u district was abolished, but the command remained the same. In 1900 the Upper Chindwin district was added to, and Sagaing and Shwebo districts detached from the command; there have been no subsequent changes and the command now embraces the two Chindwins. The designation was changed from 'Lower Chindwin' to 'Karen' Battalion in 1899—when Karen companies were transferred from Toungoo—and to 'Chindwin' Battalion in 1900.

Strength.

The strength of the 'Hindustani Levy' at the end of 1886 was 733 men: of the 'Chindwin' Battalion, at the end of 1887, 1,311; of the 'Lower Chindwin' Battalion, at the end of 1888, 779; at the end of 1889, 881; at the end of 1890, 676; at the end of 1891, on the amalgamation of the Sagaing Battalion, 790; at the end of 1893, on the amalgamation of the Ye-u Battalion, 1,069; at the end of 1899, on a reduction of two companies, 811; at the end of 1900, on the incorporation of the Upper Chindwin and the detachment of the Sagaing and Shwebo contingents, 1,059; the

sanctioned strength has since been ten companies and 1,130 men, comprising 10 *subadars*, 20 *jemadars*, 60 *havildars*, 40 *naiks*, and 1,000 sepoys; with 65 followers, one *salutri*, two armourers, three clerks and a Karen interpreter. The class composition is—four companies of Sikhs, and two each of Hindustani Muhammadans, Punjabi Muhammadans, and Karens. The strength at headquarters varies with the time of year, and is greatest in the rains, when the frontier posts are unhealthy.

Outposts. Besides headquarters at Mônywa, the following outposts within the district have been held at various times:—Maungdaung, Salingyi, Budalin, Thazi, Lemye, Kudaw, Baunggya, Nyaunggan, Alôn, Kyadet, Lè-ngauk, Yèdwet, Chinbyit, Mindaingbin, Magyizauk, Zeiktaung, Palè and Yinmabin. Since 1902 there has been a single outpost in the Lower Chindwin district—at Yinmabin.

History. The military and semi-military operations of the early years after annexation have been outlined in Chapter II. Notable encounters with dacoits took place in 1888 at Kudaw and Kyadet, and in the Shitywa valley. The Battalion sent a force into the Yaw valley of Pakôkku in 1889, and there was an encounter with dacoits at Kudaw in the same year. In 1891, on the occasion of the Manipur rebellion, a detachment was ordered to proceed from Mônywa, and, after forced marches for a portion of the way, reached but was recalled from Tammu near the Manipur border.

Miscellaneous. Besides garrisoning frontier and important interior posts, the Battalion supplies escorts over prisoners and treasure; guards over jails, lock-ups and treasure; and personal escorts to district officers.

Cost. The cost of the Battalion in recent years has been—

	Rs.		Rs.
1905	2,86,909	1907	2,77,189
1906	2,84,882	1908	2,81,376

Criminal Justice. The magistrates exercising powers in the district are the Deputy Commissioner, who is District Magistrate, two Subdivisional and five Township Officers, who are magistrates for the civil subdivisions and townships respectively, a Headquarters Magistrate, and a bench of three Honorary Magistrates. This was constituted in August 1908. The Battalion Commandant is a special magistrate, and exercises powers of the first class for the trial of offences under certain Acts. Thirty-one headmen are invested with power to try petty criminal offences.

The number of crimes reported has been, beginning with 1889:—357, 488, 538, 641, 593, 533, 535, 505, 457, 624, 612, 628, 877, 904, 790, 792, 763, 803, 867 and 870. The figures in the reports indicate that in the early years of the period the volume of important crime triable under the Indian Penal Code tended to fall, and that triable under special laws to rise. In the later years, the opposite tendency emerges. The total volume of crime has risen steadily. The increase is no doubt in part true and due to normal causes, namely, increase of population, the coming of the railway and the freer movement of the people, and in part apparent and due to better investigation and greater readiness on the part of the public to report offences. **Amount of crime.**

The number of offences against property (dacoity, robbery and attempts at robbery, house-breaking, house-trespass, criminal trespass, cattle-theft, other theft, and receiving stolen property) diminished rapidly as the district came under control. The figures of cases decided to be true are, beginning with 1889 —142, 205, 239, 289, 240, 211, 210, 129, 122, 117 and, in 1899, 94. **Offences against property up to 1899.**

The true cognizable cases falling within Class III, serious offences against the person and property or against property (dacoity, robbery, serious mischief, house-trespass of the graver kinds, receiving stolen property), have been as follows since 1898, and show no marked tendency to increase:—44, 34, 38, 40, 43, 45, 43, 42, 45, 44 and 53. **Class III cases since 1898.**

The opposite tendency is exhibited in the statistics of offences against the person (murder, attempt at murder, culpable homicide, attempt at culpable homicide, grievous hurt, rape, hurt, and criminal force). The true cases, year by year, have been as follows, beginning with 1889:—45, 51, 71, 81, 94, 99, 82, 96, 97, 103 and, in 1899, 125. These figures are, however, of all kinds of crime against the body. The graver offences are few in number, and the growth in the general figure is, no doubt, in part attributable to better reporting and possibly to the courts being less ready to allow the composition of offences of hurt. **Offences against the human body up to 1899.**

The cases of violent crime (murder, attempted murder, culpable homicide, dacoity, robbery and house-breaking of the graver kinds) have numbered, from 1889:—48, 2, 6, 13, 10, 8, 5, 3, 5, 8, 8, 6, 4, 6, 9, 5, 9, 9, 16 and 17. There was an exceptional number of murders and attempts to murder in 1907 and 1908. **Violent crime.**

Dacoity. Dacoity is sporadic, and there are no gangs. Excluding four years (of which the records have been destroyed), the only years in which dacoities have been reported are: 1888, when it was stated that the number must have approached 100; 1889, 20; 1900, 1; 1902, 1; 1903, 4; 1904, 1; 1906, 1. The decrease from 100 in 1888 to *nil* in 1890 indicates the progress of pacification. It is noticeable that in 1908 there was no successful case of dacoity and no increase of robbery, although the year was one of widespread failure of crops. The most noteworthy dacoities of recent years have been: in 1904, when there was a dacoity with firearms, but all the members of the gang, with the guns, were captured and three of the gang were convicted: and in 1907, when an undertrial prisoner, an *ex*-monk, U Athapa, escaped from the Yinmabin Police Station with arms, and, forming a gang, attempted to dacoit Paunggada village. The attempt was unsuccessful, but the leader of the gang is still at large, though some of his followers and some of the guns have recently been recovered.

Robberies. Robberies are also infrequent. Excluding the same four years (1894 to 1897), the figures have been—1889, 18; 1890, 1; 1891, 0; 1892, 7; 1893, 6; 1898, 4; 1899, 2; 1900, 2; 1901, 1; 1902, 3; 1903, 3; 1904, 2; 1905, 3; 1906, 4; 1907, 5; 1908, 5.

Cattle-theft. There are more than 250,000 head of cattle in the district, but cattle-theft is not now—and never has been—conducted on the organized and extensive scale met with in Lower Burma. The figures of cattle-theft cases, reported to be true, have been as follows, beginning with 1890:—57, 51, 31, 25, 18, 17, 13, 28, 23, 14, 15, 23, 11, 26, 19, 19, 28, 45, and 10. The decrease in the earlier years was the natural result of the pacification of the country. The high figure of 1907 is to be ascribed to the failure of the rains, which diminished grazing and caused the cattle to wander, whilst at the same time enhancing the temptation to steal. The district may be said to be practically free from cattle-theft. The infrequency of this form of crime is usually, and no doubt rightly attributed to the law-abiding nature of the people. Up to the present, the orders requiring villages to be stoutly fenced and closed at nightfall have been enforced and, as cattle are almost always kept within the village at night, the chance of theft is minimized.

Opium. The use of opium is exceptional. The number of cases under the Opium Act has risen steadily, from two in 1899 and seven in 1904 to twenty-seven in 1908, but the rise is attributable to the presence, in recent years, of a special

excise preventive establishment, and all the cases have been of a petty nature. There is believed to be no smuggling on a large scale, though the bamboo rafts which come down the Chindwin afford an easy means of concealing opium.

Excise. Excise cases have numbered, from 1898,—23, 23, 39, 60, 60, 54, 59, 102, 48, 75 and 92. The increase in cases from 1901-02 is ascribed to the larger number of *tari* shops and the increased area to which the sanctions of the *tari* law became applicable. The large number of *tari* palms affords facilities of obtaining fermented liquor, and it is stated that a high proportion of the crimes of violence can be traced to the influence of drink: the range of figures is, however, at present too small to establish the existence of a ratio between the number of excise cases and the amount of violent crime. The special Excise Establishment—now consisting of one Resident Excise Officer, one Sub-Inspector, one clerk and two menials—was, up to 1908, under the immediate control of the District Superintendent of Police, but now reports directly to the Deputy Commissioner. The smallness of the Excise staff, the fear on the part of village headmen that they will become unpopular if they check drinking, and the extent of the palm groves, it is stated, combine to make offences against the Excise law common.

Gambling. The habit of gambling pervades the district, and is said to be especially rife on the Shwebo border. The number of cases taken up by the Police has been as follows:—1897, 29; 1898, 74; 1899, 118; 1900, 103; 1901, 47; 1902, 71; 1903, 77; 1904, 61; 1905, 134; 1906, 160; 1907, 162; 1908, 166. The connection between gambling and crime is often denied in the reports, and the figures suggest no inference on the point. Professional gambling has not been noticed except in 1903, when a Chinese gambling club was opened in Mônywa. It was closed, by authority, in the same year.

The preventive sections. The number of persons proceeded against under the preventive or 'bad livelihood' provisions of the law, in virtue of which certain classes of habitual offenders and suspected persons can be ordered to show cause why they should not give sureties for their good behaviour, has been, since 1889,—27, 22, 14, 25, 6, 7, 6, 18, 17, 82, 40, 34, 10, 4, 14, 15, 17.

Since the disturbances ensuing on annexation terminated, the district has been generally more free from serious crime than most districts of the province. In 1893 it was stated that the people of the country [Upper Burma] might be

said to be essentially criminal in disposition, and to require little provocation or inducement to be led into breaking the law. [*Report on Criminal Justice*, 1893, page 10.] This condemnation was, however, inapplicable to the Lower Chindwin district. The number of cases cognizable directly by the Police (excluding nuisances) was, in each year from 1892 to 1897, the equivalent of one to over 500 souls of the population: in 1898 of one to between 400 and 500 souls; that is to say, in six of the seven years for which this statistic is furnished in the reports, the district was either alone, or one of a few districts, in the category showing the lowest percentage of crime to population, and in 1896 the Commissioner of the Sagaing Division stated that crime of a serious nature was almost unknown. The volume of crime has increased since 1898, but the district remains relatively law-abiding.

Prisons. There is a fourth class district jail, with accommodation for 100 prisoners, at Mônywa. It was opened in the latter part of 1888. The buildings stand within a rectangular enclosure of 400 by 184 feet, surrounded by a lofty brick wall. Prisoners sentenced to terms up to and including five years by the courts of the Lower Chindwin district are confined in the jail. Supervision is secured by a subordinate staff of one jailor, one deputy jailor, and fifteen warders. The services of convict warders are also utilized. The control of the jail rests with the Civil Surgeon of the district. The average daily jail population in the six years ending with 1907 has been—77, 72, 78, 81, 87, 101 (males), 4, 2, 2, 1, 0, 0 (females). With the exceptions of 1893 and 1898—in the latter year there was an outbreak of cholera—the health of the jail has been uniformly good. The water-supply is drawn from a well just outside the main building. Analysis in 1891 described the water as doubtful in quality. Recent analysis (January 1900) describes it as good, potable water. The use of the grain of millet, which is the food of a large proportion of the people of the district, as an article of jail dietary was tried in 1893 and discontinued in 1894, the sickness in the jail in 1893 being attributed to it. The experiment was again tried in 1902, but was discontinued in 1903, as the grain was suspected of leading to gastric disorders. There have been escapes from the jail, in 1895 and 1898.

The statistics of the jail confirm the usual experience that habitual prisoners are more prone to commit jail offences than ordinary prisoners, and, so far as the structural arrangement

of the jail permits, habituals are kept apart from ordinary prisoners. The number of prisoners who are found to have been in the habit, in freedom, of consuming opium, is small. Jail industries comprise the grinding of wheat for the use of the Chindwin Military Police Battalion, carpentry, and a little bamboo work. There are also small receipts from the sale of vegetables produced in the jail garden. The annual receipts have fluctuated, chiefly with the demand for wheat from the Battalion, but the average annual earnings per prisoner may be estimated at Rs. 25, and the gross cost at Rs. 92.

Public Works administration.

The district formed a separate Public Works Division from 1891-92 to 1893-94; in the latter year it became one of the three subdivisions of the Chindwin Division, and the headquarters of that division and of the Executive Engineer are at Mônywa. The executive and clerical staff consists of one permanent upper subordinate, one temporary store-keeper, one sub-overseer, one accountant, five clerks, two draftsmen and six menials.

Public buildings.

The chief public buildings borne on the books of the Public Works Department are—at Mônywa: seven barracks for the Military Police; a Military Police Hospital, with accommodation for 102 patients; quarters for a Subadar-Major and eight Native Officers; married quarters for forty-seven families, quarters for a Hospital Assistant and compounder; a Battalion office; stables for 70 ponies and 74 transport ponies; Post Office; Telegraph Office; Jail buildings; Deputy Commissioner's court-house and Record-room and Land Records office; Executive Engineer's office; Civil Police-station; a cemetery and chapel; Survey-school; an opium shop; quarters for the Deputy Commissioner, Battalion Commandant, District Superintendent of Police, Executive Engineer, Civil Surgeon, Civil Police Subdivisional Officer, and Public Works Department Accountant; Postal Superintendent's office and quarters. There are court-houses at Alôn, Budalin, Kani, Palè, Salingyi and Yinmabin, and Civil Police-stations at Alôn, Ayadaw, Budalin, Kani, Kin, Kudaw, Palè, Salingyi and Yinmabin. There is a court and circuit house at Mônywa, for the use of the Commissioner of the Division and other high officers of Government; a *dâk*, or travellers.' bungalow at Mônywa; and circuit-rooms, for the use of judicial inspecting officers, in the court-houses at Budalin, Palè, Alôn, Salingyi, Kani and Yinmabin. There are ten inspection bungalows controlled by the Public Works Department, *vide*

Chapter VII; and six inspection bungalows, erected at the cost of the District Fund and controlled by the Deputy Commissioner, at Alôn, Kani, Kin, Chaungmadaw, half-way between Kani and Yinmabin, Mintaingbin, Chinbyit, Zeiktaung and Magyizauk. The Forest Department bungalows have been noticed in Chapter V.

Postal and Telegraph arrangements.

A daily service of postal runners to Mônywa was established in 1888-89, and the mails were carried by them until the opening of the railway in April 1900. The district *dâk* (Post) system was extended to the district in December 1899, and in 1905 the District Fund paid for the Post offices at Salingyi and Palè, and for runners' lines from Mônywa to Yinmabin, Yinmabin to Palè, Yinmabin to Salingyi, and Alôn to Budalin. These offices and establishments were provisionally transferred to Imperial Services from the 1st of March 1906, when the district *dâk* was abolished. For purposes of administration, the district now falls within the Chindwin Postal Division, of which the headquarters, under a Superintendent, are at Mônywa There are Post offices at Mônywa (erected in 1888-89), Alôn, Budalin, Kani, Palè, Salingyi and Yinmabin. The six last-named are branch offices, and are usually worked at a loss, and the Burmans of the district have not yet learnt to make much use of the Post. There are, however, some signs of development, particularly in the Savings Bank branch. There were no Burmese depositors in 1904, whereas at the time of writing (1909), one-fifth of the accounts at the Mônywa Post Office are in the names of Burmans. The Post Office establishment consists of one postmaster, six branch postmasters, five clerks, five mail runners, one mail overseer, one mail contractor, six postmen, one packer and one menial.

Temporary telegraph lines were opened soon after annexation, in order to facilitate operations against the dacoit bands. The existing line from Mônywa through Myinmu to Sagaing was opened in 1886, and dismantled and reconstructed along the railway during 1898-99. It was connected with Manipur in 1889-90. The line follows the eastern bank of the Chindwin as far as Shwezayè, crosses the defile by an overhead line, and thereafter follows the western bank of the river until it leaves the district at Kin. A line was erected for the railway, between Sagaing and Mônywa, in 1899-1900, in which year a Railway Telegraph office was opened at each of the four railway-stations within the district. For purposes of

Telegraph administration, the district falls partly within the Chindwin and partly within the Mandalay subdivisions of the Upper Burma Division, the portion of the district west of Alôn railway-station belonging to the Chindwin subdivision. There is a separate Telegraph office at Mônywa and a joint Post and Telegraph office at Kani. The latter was opened in 1900-01. Mônywa is the headquarters of an Assistant Superintendent of Telegraphs.

Ecclesiastical. There is no Government chaplain permanently stationed at Mônywa, but the Riverine Chaplain, a member of the Additional Clergy Society, visits the station on one Sunday in each month. The missions which work in the district have been noticed in Chapter III. There is a cemetery, under Government control, for the interment of Christians, at Mônywa.

CHAPTER X.—Revenue Administration.

For accounts of the revenue of the Burmese kings in early times, a reference may be made to Sangermano's *Description of the Burmese Empire* and Symes' *Embassy to Ava*. The *British Burma Gazetteer* (Volume I, page 446) describes the method of collecting the revenue in 1826, at the time of the cession of Arakan and Tenasserim.

Revenue in Burmese times: *thathameda*. Athough the right of the king to one-tenth of the produce was, apparently from the earliest times, recognized as theoretically just, it is not known in what year the household tax, *thathameda*, was first imposed. It was certainly imposed throughout the greater part of king Mindôn's reign, and is said to have been originally fixed at one rupee per house. It had risen by 1886 to Rs. 8 and in most places Rs. 10. It was up to the time of annexation the chief—as it is still a considerable—source of revenue. The method of assessment of *thathameda* was in late Burmese times through assessors selected by the villagers themselves. The assessment rolls were submitted by the headmen to the local Governor (*wun*) of the administrative district (*nè*), who submitted them to the *hlutdaw*, the central administrative office at the capital, together with the revenue collected. A detailed account of the method of collection is given at pages 413 to 416 of the *Gazetteer of Upper Burma*. The assessment rolls were seldom checked.

The Burmese divisions comprised within what is now the Lower Chindwin district have been enumerated in the preceding chapter. The *thathameda* demand from these areas is stated to have been as follows in Burmese times (*Upper Burma Gazetteer*, Part I, Volume II, page 420) :—

Burmese Divisions.	1869.	1884-85.	Remarks.
	Rs.	Rs.	
Pagyi ...	79,172	33,744	The whole collected from villages falling within the district.
Kani ...	45,135	27,560	The greater portion collected from villages falling within the district.
Alôn ...	1,62,156	76,056	Do.
Total ...	2,86,464	1,37,360	

To which should be added—(*a*) on account of Amyin, approximately one-half of the demand from the Amyin and Chaungu jurisdictions, the two together contributing as follows :—

1869	1884-85.
Rs.	Rs.
50,700	44,968

and (*b*) the demand from the 550 households in the Kyaukmyet villages. The rate in 1869 is said to have been Rs. 8, and in Thibaw's reign Rs. 10 .—

1869	1884-85.
Rs.	Rs.
4,400	5,500

These figures, taken for what they are worth, indicate that in king Mindôn's time, when *thathameda* was at its highest —the rate is said to have reached Rs. 10 in most places in 1869—the demand from the district was over three lakhs of rupees, and immediately before annexation, when the Burmese Government had lost its grip of the administration, to something over a lakh and a half. In the latter year

hardly more than one-half of the enumerated households appear to have been actually assessed; there was no scrutiny of the *thathameda* rolls and, in the Alôn Governorship, owing to the prevalence of dacoity, the tax was collected at a six-rupee instead of a ten-rupee rate. To the demand in Mindôn's time should be added the Governor's salary (Rs. 3,600, *vide* Sagaing *Settlement Report*, paragraph 54) and ten per cent. for the cost of collection, making the total demand in Mindôn's time some three lakhs and a half.

Royal lands: collections in Burmese times.

On the few Royal lands in the district, the assessment in Burmese times was a fraction of the produce of the land converted into money at the current market rates. The right to collect this assessment was sold by auction, and the farmer of the revenue exacted as much as he could from the cultivators. Royal lands contributed a few thousand rupees only in 1884.

Miscellaneous revenue in Burmese times.

The sources of miscellaneous revenue were levies on forest produce, customs, fines, rents of market-stalls, fisheries, and brokerage, and these in Burmese times realized in the Alôn Governorship Rs. 43,000 per annum; the sum appears to have been made up chiefly of the Chindwin customs duty, Rs. 34,000, and the Chindwin rubber duty, Rs. 5,000. The collection was farmed by an official, who was styled *kinôk* (supervisor of toll stations). The collections under these heads in the other governorships are not known. Law and Justice receipts brought in annually Rs. 8,000 from Alôn; the amounts contributed by the other governorships are not known. From the Chindwin forests, some of which fell within the district, was collected one lakh of rupees. The right to collect dues from market-stalls at the following pagoda and spirit festivals was sold and produced a small amount :—

In Amyin—at Thitsein, near Nyaungbyubin.

In Pagyi—at U-hnauk and Nyaunggôn in the south-west of the district; at Myogyi, near Yinmabin; at Kyadet, Taya, Lè-ngauk, Lettaung near Palè, Palè, Teinnè, east of Chinbyit, and Powindaung.

In Alôn—at Kyaukka, Yelègyun, south of Mônywa, Ngwechaung, Bawga, Pyinzinkan, Kanbya, Yeyo, north-west of Ayadaw, Kyetsugôn, Wan-o, Mônywa, Lèzin, Sinyan, Wetye, north of Kudaw, Kawkathan, Pôndu, Nyaunggan, Maungdaung, Thazi and Letaungpyin.

Estimate of total collections in Burmese times.

The collection from the district in the latter part of Mindôn's reign may therefore be estimated at—

		Rs.
Thathameda—	Pagyi, Alôn, Kani	2,86,000
	Amyin	25,000
	Kyaukmyet	4,400
The salary of three Governors		10,800
		3,26,200
One-ninth more to cover the cost of collection ...		36,244
		3,62,444
Royal land		2,000
Miscellaneous sources (Alôn)		43,000
Law and Justice (Alôn)		8,000
A portion of the Chindwin rubber duty and the Chindwin forests duty, and miscellaneous and judicial receipts from Kani, Pagyi and Amyin		?
Total ...		4,15,444

In king Thibaw's time the collection probably did not exceed one-half of this.

The Military aids.

In addition to the revenue paid in the shape of formal imposts in Burmese times, each conscript circle, *vide infra*, was required to supply a sum varying from Rs. 4 to Rs. 6 *per mensem* to the conscript. Placing the strength of the regiments of the Inner and Outer Brigades at no more than five hundred men each, this would imply a total annual contribution of Rs 2,88,000,* a very large addition to the State demand. The subvention was called *nauk-htauk-gye*.

Gross revenue since annexation.

The gross revenue since annexation has increased steadily: from Rs. 2,81,955 in 1888-89, Rs. 4,40,844 in 1892-93, Rs. 5,52,677 in 1896-97 and Rs. 6,58,964 in 1901-02 to Rs. 7,01,967 (the land revenue and *thathameda* heads only) in 1908-09. The bulk of the revenue comes from the acre-rates on the land and from *thathameda*.

Land revenue: State-land assessments after annexation.

After annexation, the small areas of Royal land taken over from Burmese times and later extensions into the waste were assessed at one-third of the gross produce, commuted into money. Appraisement was made by the headmen and assessors [in Kani until 1889 by the *ayadawôk*, or supervisor of State lands], who also fixed the opening village price at which the State share was commuted.

Early surveys.

Lists of Royal lands were submitted by headmen in 1887 and, beginning with 1889, Royal lands were surveyed.

* 500 × 12 (regiments) × Rs. 4 (monthly subvention) × 12 (months) = annual subvention of Rs. 2,88,000.

The townships of Mônywa and Kudaw (the western half of the existing Mônywa and Budalin townships) and Eastern Pagyi (Salingyi) were found to contain 1,453 acres of Royal land. The survey was by the block, not by the holding or field.

The cadastral survey.

With a view to the introduction of a scientific settlement of the land-revenue, a cadastral, or field-to-field survey was carried through in the years 1897 to 1902, the only areas excluded being—

(*a*) the Forest Reserves in the west of the district, in which there is no cultivation; and

(*b*) some isolated blocks of uncultivated land, of which the most extensive occur north and south of the Yewa valley.

The cadastral survey divided the whole culturable area into survey-blocks, each block taking up an area of from one to four square miles of cultivation and adjacent waste.

The Summary Settlement.

The next step in imposing an acre assessment is ordinarily the regular Revenue Settlement, but, as the organized settlement parties were otherwise employed, the district was at the outset settled summarily, the operations lasting from the end of 1900 until December 1903. A separate 'ring-fence' area was settled in each year, but there was no subdivision into assessment-tracts varying with the local circumstances. Each of the four summary-settlement blocks formed one large assessment-tract, with one schedule of acre-rates applicable to all the cropped land within it. The district was settled thus—

1900-01.—The Mônywa township.

1901.—The Budalin township, together with the portion of Kani east of the Chindwin river.

1902.—The Salingyi township and the immediately adjoining portions of Palè and Kani townships.

1903.—The outlying portions of the Palè and Kani townships.

The cultivated land was classified, the classification being naturally unelaborate, since the Summary Settlement was to hold good only until the arrival of the Regular Settlement. The main orders of soil recognized by the Summary Settlement were few in number, and the classes within each order were also few. From Burmese times the bulk of the land actually in cultivating occupation—that is to say, land other than the waste—had been claimed as non-State *i.e.*, as privately-owned. The Summary Settlement recorded the tenure of each holding as State or non-State, and differentiating rates of land-revenue—the higher apply-

ing to State and the lower to non-State land—were imposed for certain orders of soil, *e.g.*, rice land, but not for others, *e.g.*, ordinary upland dry-crop land. The revenue on the large number of *tari* palms is, under the Summary Settlement, collected in the shape of an acre-rate. Trees are not assessed unless they form a grove, *i.e.*, there must be forty or more trees to the acre; and a grove is not considered assessable unless it contains at least twenty climbed trees to the acre.

Before Summary Settlement, the bulk of the revenue of the district was collected in the *thathameda*, which was the product of the number of assessable households* in the district into ten rupees, the sanctioned district rate. The village demand was distributed among the households by village assessors, chosen by the people themselves. As a corollary to the imposition of land-revenue on the privately-owned land, it became necessary to reduce the demand from the *thathameda*-tax, in order to ensure that the cultivator should not pay twice over, once in the shape of the acre-rates and again in the *thathameda*. The reduction in the district rate of *thathameda* sanctioned at Summary Settlement was from ten to six rupees.

The district is, at the time of writing, assessed at the rates of land-revenue sanctioned at Summary Settlement, and at the reduced six-rupee rate of *thathameda*. The range of rates per acre on the main orders of soil is: State rice-lands from Rs. 2·25 to Rs 1·50; non-State rice-lands from Rs. 1·75 to Rs. 1·125; upland dry crop (*ya*) land from Re. ·75 to Re. ·25.

The Regular Settlement. The operations of Regular Settlement commenced in April 1906 and terminated in June 1909. The soils of the occupied area were reclassified, a degree of elaboration being attempted; for example, the dry-crop black soils were classified in an order by themselves, independently of the red soils. Numerous crop experiments were conducted. Enquiry was made into the cost of cultivation of the standard crops, and the nett produce per acre of each class of soil was calculated. Detailed enquiries were also made into the income of the agricultural section of the people, with a view to readjusting the rates of *thathameda*. The circumstances of tenancies and the rentals paid were investigated.

At the time of writing, the report on the operations of Regular Settlement is being printed.

* Various categories of households are exempt, *e.g.*, the newly married, ministers of religion and school-masters, village officials, and indigent persons.

The orders as to tenures passed at Summary Settlement were—on account of faults of procedure—set aside when the operations of Regular Settlement commenced in 1906, and tenures were settled afresh. Two tenures only were recognized by the Regular Settlement, the State tenure and the non-State tenure.

Land tenures.

The enquiries made it clear that practically all land in the district had been held in Burmese times, and was still held, on a tenure which included full rights of transfer, inheritance and leasing. The right of sale was everywhere asserted, though sales hardly ever took place. Mortgages were very common. A large portion of the district was found to be occupied by soldiery and reserves and their descendants, but there was no restriction in Burmese times on the transfer—to whomsoever they pleased—of the land occupied by them, nor could they exercise any special right of preemption, apart from that which originated in blood relationship. Except in a few instances in out-of-the-way parts of the district, the exclusive proprietary right of the first clearer, the *dhama-u-gya* right, was found to be strongly asserted.

The non-State or private tenure.

The following paragraphs deal briefly with the five categories of State land specified in the Upper Burma Land and Revenue Regulation:—

The State tenure.

(a) *Royal land.*—Small areas of recent cultivation were found in the Kani township which had been in Burmese times assessed as Royal land at one-tenth of the gross produce. *Theinzu,* confiscated lands, occur here and there, the most considerable area being the lands in the Palè and Salingyi townships known as Maung Taung Bo's escheat. *Sônthe amwebyat,* land reverted to the Crown for failure of heirs, was also met with.

(b) *Service land: Major regiments.*—These are enumerated in the preceding Chapter. It is not known when they were organized, but they are said to have been created gradually, as successive kings of Burma found the need of a larger militia. Recruitment appears to have been as follows. On the first creation of a regiment the quota of guns to be supplied by each village was fixed, and the existing families were organized into circles, *daing,* each liable for one gun. It is probable that all the families in a circle were, at the outset, blood relations, although, towards the end of the monarchy, the blood-tie had disappeared. On the occasion of a casualty in the regiment at the capital, the circle to which the casualty belonged was required to supply a substitute. Hiring was not forbidden,

and if the heads of families in the circle were men of substance they usually hired their relief. If they were too poor to hire, one of their number had to serve. Although the fact of belonging to a regiment was a source of pride, the actual service was extremely unpopular. As often as not, wife and children accompanied the conscript to Mandalay, no doubt as hostages against misbehaviour and desertion.

As regards the tenure of the lands occupied by the regular soldiers and reserves, a soldier on departing for his regiment could dispose of his land as he pleased, subject to the right of blood relations to the pre-emption or mortgage, and all rents received went to him. The reserves of his circle could not, as such, exercise the right of pre-emption. He was exempt from the household tax so long as he was on service, but paid it at the village rate on his return. The reserves paid the tax throughout, and there was no special rate of *thathameda* applying to them. On death his land went to the heirs by blood of the conscript, his daughters shared equally with his sons, and, on marriage of a daughter, her land went over with her to her husband's side. There was no restriction on marriage: a daughter could marry into her father's circle or into some other circle. In short, so far as the tenure of their land went, the infantry and their reserves were on exactly the same footing as the man who belonged to no *daing* and was not liable to regular service. Having regard to the fact that in the case of the Shan soldiery, *vide infra*, the right to hold land is admitted to have depended on service, whilst this restriction is nowhere recognized in the case of the Burmese infantry, it seems probable that the service was imposed, not on original settlement of the lands, but at some later date, by means of an exercise of sovereign power on the part of the Burmese king. The land occupied by the regular soldiers and reserves was allowed as non-State at Regular Settlement.

Minor regiments (*aso-the*).—The incidents of organization and land tenure did not differ from those of the twelve regiments, and there was nothing to indicate a State tenure.

Occasional levies.—These were called *thin*, a term the derivation of which is obscure.* No evidence was forth-

* *Athin*, an association, has been suggested, but does not accord with the facts. There was no association. It has also been suggested that the word is a corruption of *athi*, a stranger (as in the phrase *athi ala win ne kappa*, new-comers, but etymologically it seems doubtful whether the verbal transition from *athi* to *athin* is possible, and there is no history of foreign blood.

coming as to the original separation of the *thin* country. There was no organization into reserve circles. There were no restrictions on the right to transfer land, and *thin* lands were allowed as non-State.

Shan Service land.—Small areas of Shan service land of the *Yun Kaunghan* corps were met with in several places in the Pagyi Governorship, and in one or two pla es in Kani, chiefly along the North Yama stream. There was evidence that the Shans were not allowed to alienate their land. All Shan service lands which could be pointed out were declared State. In later times the corps is said to have been recruited from Pagan, Sagu, Allagappa in Sagaing, and Siuinthawatti (?), besides the Shan villages in the Lower Chindwin.

. Shan service land of the *Tat Kaunghan* corps is mentioned in a *sittan*, or official report, from Thigôn village near the North Yama, and along the Taya stream near the South Yama. The Shans were brought from Zimmè in Siam, apparently at the same time as the *Yun Kaunghan*.

There were two other branches of this small corps, the *Win Kaunghan* and the *Daing Kaunghan*. The *Tat Kaunghan* served as lictors in attendance on the ministers in the *hlutdaw*, or Great Council. The *Yun* policed the exterior of the palace stockade. The *Win* were armed with muskets, and stood on sentry guard at the gate of this stockade. The *Daing* were also armed and guarded the Red Gate and the postern gate. The four branches of the corps are stated to have been under the control of the *Kaunghan wun*, or governor, the *Yunsu wun*, the *Windaw hmu*, and the *Daing wun*. The gradation of ranks in the Shan corps was—the *nge'tha*, or private; above him, the *o-thugyi* or *o-sa-gyi*; the *a-hmu*, the *sa-ye*, and the *wun*, the highest rank.

Small areas of *thugyisa* land—the appanage of the office of headman—came to light, and, to the south of Mônywa, there is some land which was assigned to members of the Royal family. These were declared State. Other parts of the district were the titular appanage of members of the Royal family, but no rents were paid, and the services rendered appear to have consisted in making a trifling present occasionally.

(c) *Islands and alluvial formations.*—The true islands in the Chindwin are small; in the Mu there are no islands; and in the smaller streams such islands as appear from time to time are inconsiderable sand-banks. True islands were

declared State. All low-lying land in the beds of streams and rivers was declared State.

South of Môuywa there is an extensive area of alluvial land, some of which, though high-lying, is occasionally submerged (*chaungdein*) The non-State tenure was generally asserted over these permanent, though periodically inundated, formations, and the claim was supported by old mortgage deeds and, when this part of the district was transferred from Sagaing in 1894, had been allowed by an order of the Deputy Commissioner, Lower Chindwin. The non-State claim was allowed over the major portion of this land. Small areas of *chaungdein* land along the Chindwin were known as Royal land and were declared State, but most of the *chaungdein* land, in whatever part of the district situated, was admitted as non-State.

(d) *Waste land.*—There is no doubt that there was great extension of cultivation into the waste subsequently to the 13th July 1889, when the Upper Burma Land and Revenue Regulation came into force, and that much new cultivation was not reported and escaped survey. The Regular Settlement took as the point of departure the cadastral survey map of 1897 - 1902, and the Summary Settlement map which immediately followed it. All land found waste at the Regular Settlement was declared State. All land shown in waste survey-numbers on the cadastral survey maps and not claimed at the Summary Settlement was treated as *primâ facie* State. The claim to the whole of the waste as the private property, not of the villagers as a body but of particular individuals, was occasionally put forward. It was not admitted. All village-sites were *ab initio* declared State, and claims were decided in the usual way. The non-State tenure was allowed in a few villages, most of which disclosed a history of the site encroaching on adjacent cultivation, but for the most part no claims were made. The private right may be said generally not to have grown up in the village-site, the tenure of which was, in a sense, communal, although the occupant of a house-site could not be ejected.

The water-bearing waste in the spring and artesian-well areas near the Yama streams was declared State, and, in order to ensure existing water-rights, the persons who were found in actual customary possession of the exclusive right to bore in the waste for water were recorded as State tenants. The beds of the numerous small tanks are rarely cultivated for a winter crop. They were allowed as non-State in a few cases.

(e) *Abandoned land.*—The earliest cadastral survey map was taken as the point of departure. Land shown within field numbers at the survey and not claimed as non-State at the Summary Settlement was treated as *primâ facie* State.

Tenures: miscellaneous.

In the Mayin village-tract, comprising six remote survey-blocks in the south-west of the district, there is a history of successive colonizations in late Burmese times. In king Mindôn's reign the village was last colonized, but residence was made a condition of possession of land. Land could be, but was not usually, taken away from a resident in order to be allotted to a new-comer. No rent was paid to the headman. The headman—but no one else—claimed the right to mortgage land. The tenure resembles the *thu-win-nga-twet* tenure of Magwe (*Magwe Settlement Report*, paragraph 125), and arises from the need of having a numerous body to resist aggression, and the right of mortgage is due to aggrandisement by a pre-eminent family among the colonists. The whole village-tract was declared State.

In some other village-tracts, also situated under the hills in the south-west of the district, the same tenure was found, but in isolated survey-blocks, not throughout the whole of the village-tract. These lands were declared State.

Cases of aggrandisement by headmen came to light in some places. Usually the aggrandisement dated from many years back and was acquiesced in by the people, and in such cases the Settlement accepted the facts and allowed the non-State claim.

The only communal land recognized is the village-site, in most cases ; the cemetery, in all cases , the sites of rest-houses and tanks in most cases The sites of monasteries are also regarded as communal. There is no communal cultivated land in the district. No special conditions were attached to the tenure of any land declared State. The tenure of lands falling within the Municipal area of Mônywa and the Town area of Alôn was not dealt with at the Regular Settlement.

Property in fruit trees.

The property in fruit trees of the longer-aged kinds, *e.g.*, *tari* and cocoanut palms, and mangoes, is regarded by the people as distinct from the property in the land on which they grow. The private ownership of *tari* palms growing on waste (State) land was usually claimed, and in most cases admitted.

Area of land by tenure.

The area of State and non-State land (excluding the forest reserves and unsurveyed areas) as ascertained at Regular Settlement was—

				Acres.
State land	...	...	...	102,004
Non-State land	...	...	...	670,704

***Thathameda* before Summary Settlement.**

It has been mentioned that the household tax was the main source of revenue before the Summary Settlement. The individual assessments varied between house and house, according to the relative means of each from all sources.

After Summary Settlement.

After acre-rates have been imposed on non-State land by means of a Revenue Settlement, the principle of apportionment of the *thathameda* tax changes It becomes incorrect to assess a household to *thathameda* according to its means from all sources. *Thathameda* is to be assessed only on the non-agricultural sources of income, *e.g.*, trading profits, receipts from the sale of cattle, profits of emigration, profits from the wage of unskilled labour. Agricultural profits, which are assessed (fully, if the settlement is a regular one) in the acre-rates, are to go free of *thathameda* There will still be a general household rate, prevailing over a compact area and fixed in accordance with the general ratio within that area of non-agricultural to agricultural profits but no agricultural profits will be assessable to the tax The pure agriculturist will pay no *thathameda*.

Before this policy can be realized it is, however, necessary to ascertain the ratio of non-agricultural to agricultural profits by means of an elaborate enquiry, and, as such an enquiry could not be made at the Summary Settlement, the existing *thathameda* rates are only approximately correct. It was necessary to reduce the old ten-rupee rate: and, pending Regular Settlement, this rate gave place to a rate of six rupees. Attempts have been made in subsequent years to arrange the villages in groups according to their general prosperity or the reverse—not according to the extent of non-agricultural income—and a different rate has been imposed on each group of villages. Such a discrimination, based on general prosperity, is not in accordance with the principle described above. It was recognized at Summary Settlement that the *thathameda* rates were approximate, that the land rates were less than full, and that what, under an elaborate Settlement, would have been collected in the shape of acre-rates would continue to be taken in the shape of *thathameda*. The

headman and assessors were, however, instructed to pay some attention to fixing the individual *thathameda* assessments according to the extent of non-agricultural income. The attempt has not, up to the present, been successful. The answer to the question whether a particular source of income is agricultural or non-agricultural is not always, at first sight, easy. The extent of non-agricultural receipts from such sources as trading, emigration, and interest on loans is difficult to ascertain. But the main obstacle lies in the fact that in some parts of the district, *e.g.*, the south-western black-soil region, there is a numerous body of cultivators pure and simple who, whilst not yet exempt altogether from the payment of *thathameda*, should nevertheless pay much less than they were paying before Summary Settlement. In order to secure this, the non-agricultural section—usually field labourers without means of any extent—would require to be assessed at much higher rates than they could afford to pay. The dilemma is the necessary result of land-rates which are too low and a *thathameda* rate which is too high. The actual practice followed in the villages has been one of two: either all households alike have agreed to pay at the village rate, without discrimination—a method which gives no trouble and imposes no problems on the assessors,—or, the pre-Summary Settlement assessments have been reduced *pro rata*, whether the particular household is agricultural or non-agricultural.

Thathameda: Regular Settlement proposals.

The *thathameda* rates suggested by the Regular Settlement are in several tracts lower than six rupees, the lowest deduced rates appearing in the regions west of the Chindwin, where the rainfall is better and the cultivator can count on getting a living from the produce of his fields. The higher deduced rates appear east of the river, where there is, in some parts, much emigration, in others extensive cattle-breeding, in others a large population of craftsmen.

Collections of land revenue and *thathameda*.

The collection under the head of Land Revenue has been—in 1889-90, Rs. 3,944; in 1901-02, Rs. 9,273; in 1902-03, Rs. 57,238, the increase being due to the inception of Summary Settlement land-rates; in 1908-09, Rs. 3,23,984. The collections of *thathameda* have been—in 1888-89, Rs. 2,66,726; 1893-94, Rs. 4,82,413; 1901-02, Rs. 5,81,890; 1902-03, Rs. 5,05,810, the diminution being due to the reduction of the rate after Summary Settlement; and in 1908-09, Rs. 3,77,983.

The collection under the two heads together has steadily and largely increased, the figure for 1906-07—and

this was not the year of maximum collection—being 139 per cent. higher than the figure of the earliest year for which figures are available, nineteen years before. The rise in the total revenue in the years beginning with 1902-03 was due to the general enhancement secured at Summary Settlement, namely, some 20 per cent. over the existing *thathameda plus* land-revenue demand. There had, however, been a steady rise before the Summary Settlement, the 1901-02 figure being 109 per cent. higher than the earliest recorded collection. The growth in collections up to 1901-02 was not due to enhancement in the *thathameda* rate, which was—except for occasional local abatements—from the commencement of administration until 1902-03 Rs. 10 per household; nor, except to a small extent, to revision of boundaries. The only serious set-backs in prosperity and assessable capacity were the two years of widespread crop-failure, 1891-92 and 1907-08. In 1891-92 the collection under the two heads fell from Rs. 3,64,566 to Rs. 3,12,122, but rose in the next year to Rs. 4,32,441. In 1907-08, it fell from Rs. 6,75,273 to Rs 4,57,845, but rose in the following year to Rs. 7,01,967.

Dates of collection of revenue.

Collection of the *thathameda* tax at present commences on the first of January There are four seasons at which land-revenue is collected. The spring-ripening crops—for the most part the bean crops grown on islands and the inundated margins of streams, and the gram of the west of the district—are marked on the maps, and collection of the revenue due commences on the 15th April; the revenue due from the hot-weather ripening crops—chiefly the variety of rice known as *mayin*, grown in the meres on either side of the Chindwin valley—is collected from the 15th of July; that due on crops which ripen in the rainy season—chiefly the *kaukti* variety of rice, grown in the North Yama irrigated areas, and the early sesamum of the west—from the 15th October; and that due on the main winter-ripening crops of rice, millet and sesamum, from the 15th February. Only those fields are marked as liable to assessment which have produced one-fourth or more than one-fourth of an average crop. If his field returns to the cultivator less than one-fourth of an average crop, it is not assessed at all.

Coercive processes for the recovery of land-revenue and *thathameda*.

Judged by the usual test of the ratio of coercive processes to the amount of revenue collected, assessments in the Lower Chindwin district appear to be light. Since Summary Settlement, for every Rs. 24,000 of revenue collected, there has been, on the average, one attachment of property.

No outstanding balance—whether of land-revenue or *thathameda*—has appeared since 1898-99, with the exception of the year 1902-03, when there was a land-revenue arrear of Rs. 1,659; this was due to delay in the preparation of the rolls owing to the inexperience of the new Land Records staff, the year being that in which the first Summary Settlement tract came under assessment.

Incidence of taxation. The incidence of taxation under the two main heads of revenue was found to be Re. 1·55 to the crop-matured acre, and Rs. 2·22 per head of the population, in 1906-07.

Prosperity or otherwise of the district. From the data presented in this and the preceding Chapters it is possible to select the salient features of the district, so far as they bear on its prosperity and revenue-paying capacity. The increase in the population of 1906, as estimated at Regular Settlement, over the census population of 1891, was 28 per cent. In the same period the *thathameda plus* land-revenue collection rose from Rs. 3,12,122 to Rs. 6,65,296, an increase over the earlier figure of 113 per cent. The percentage increase, though large, is in reality less than this, since 1891 was an exceptionally bad year, and the revenue collection was below the average. The cultivated area has risen largely. The rapidly-expanding revenue has been collected with ease. The cultivators are of a single stock, energetic when they can see a certain crop of rice as the goal, moderately industrious everywhere, slovenly in husbandry on the poorest soils only, contented, law-abiding and amenable to the control of the headman, remarkably cheerful in adversity and, although much attached to the soil and to the right of private property in land, willing to emigrate temporarily when the prospect of the seasons is clouded. The district touches a zone of higher rainfall, and has a number of standard crops and several reaping seasons; all is not lost, even if the early or the middle or the late rains fail utterly. Recovery of the revenue, after a year of scarcity, has been rapid. Emigration has several directions in which to move, and the river and the railway afford easy means of leaving the district. The burden of indebtedness is light, even at the present time (1909), when the district has passed through the worst year within recollection. Communications are not good, but increased demand has raised the prices of produce. The population is beginning to press on the land in parts and rents are rising, but there is little rack-renting, nor has much of the land passed out of the hands of cultivators. Land values are high. There is wealth in cattle. Money is more easily come by than it was, and interest rates, although high, are

falling. The incidence of existing revenue per cultivated acre and *per capita* is high when compared with some Indian standards, but probably low, if Burmese and Indian standards of living are taken into account. Labour is more fluid than in other provinces. Widespread failure of crops may occur, but will probably never lead to famine conditions. On the other side of the picture are indications of deterioration in the water-supply.

Minor sources of revenue: fisheries. There are no important fisheries: the revenue averages Rs. 8,000 and varies little from year to year. Most of the leased fisheries are situated in the flooded depressions left on the land side of the banks of the large rivers, the Mu and the Chindwin, when the waters subside at the end of the rainy season, but there are a few in the main channels. The lakes which have formed in the basins of some of the explosion-craters produce the *twin-po*, an insect which is considered a delicacy by Burmans. It is caught in nets of coarse cloth, dried, and eaten fried, with pickled tea: the right of collection is auctioned in the case of two craters. The right to fish with casting nets less than nine feet in length, with small funnel-shaped baskets (*saung*), and to angle—except in a leased fishery—is free Certain forms of nets are prohibited, and there is a close season, from April to July. The productiveness of the fisheries varies directly with the rise in the rivers. The fisheries of the Mônywa and Kani townships bring in the bulk of the revenue. There were 33 demarcated leased fisheries in the year 1906-07. The fishing rights are sold by auction in April-June, usually for a term of three years. Hot-weather rice is cultivated in the depressions which are leased as fisheries Occasionally the lessee objects to letting the water escape, whilst the cultivator wants the level of the mere lowered, in order to expose his rice-fields for cultivation, or the lessee would let out the water more quickly than suits the cultivator, but the claims of the latter are regarded as paramount, and disputes between the fishing and cultivating interests are rare.

Miscellaneous Land Revenue includes receipts under the Village Act, survey fees on the grant or lease of land, royalties and fees on minerals, and other sources. The receipts under all these heads amounted to Rs. 4,243 in 1907-08.

Revenue from stamps. The stamp revenue is a growing source of income. It has risen from Rs. 7,949 in 1890-91, and Rs. 16,860 in 1899-1900, to Rs. 33,293 in 1907-08. Both Judicial and non-Judicial stamps have shared in the increase.

The Summary and Regular Settlements, which led, in

the one direction, to the investigation of titles in the courts and, in the other, to the substitution of properly stamped documentary for oral, or imperfect documentary, evidence of interests in land account for a portion of the increase in the later years. The introduction of unified postal and revenue stamps in October 1905 had no marked effect in retarding the growth of revenue The practice of pledging property as collateral security with a promissory note bearing a one-anna stamp was noticed at Regular Settlement in some villages. There are no salaried vendors of stamps; stamps are procurable from one *ex-officio* vendor, the Treasurer of the District Treasury, and from 121 licensed vendors, 98 of whom are village headmen. Vendors are remunerated by a small discount on the sales effected.

Excise administration: in Burmese times.

The position under the Burmese kings was that the law forbade drinking, but winked at it; and that public opinion reprobated, and the law occasionally punished, scandalous drunkenness. [Statement of U Pe Si, Magistrate of the city of Mandalay, both under king Mindôn and king Thibaw, and for a considerable period Governor of the Sagaing *nè* or Burmese administrative district; quoted at page 268 of the collection of papers relating to Excise Administration in India, 1890.] It is stated that the authorities occasionally punished both the buyer and seller, in the case of drunkenness.

After annexation.

Under the Regulation of the 19th March 1886, the sale of opium and spirits to Burmans was prohibited, and all licenses to sell opium or spirits were issued under condition that these things should not be sold to Burmans.

Excise on liquor.

It was reported at the beginning of 1888 that there was then in the Lower Chindwin district great facility for obtaining intoxicating drink, especially in the rural parts, and that a large proportion of the population—from 20 to 30 per cent.—were in the habit of using stimulants. [The same page of the collection cited above.] The indigenous sources of liquor were then and are still (*a*) the sap of the *tari* palm, which is fermented and drunk in that condition (*tari* or toddy), fermentation being accelerated by the addition of *alzn*, a yeast made from rice-water and sour toddy; (*b*) *seinyè*, or country beer, made from palm-sugar; (*c*) country spirit, (i) distilled from palm-sugar, (ii) distilled from rice. The prohibition of the sale to Burmans of any intoxicating liquor other than *tari* and country spirits is in force in Upper Burma. The privilege of vending other liquor than *tari* is disposed of by the sale of licenses, either at fixed fees or by auction. With regard to fermented *tari*,

where palms abound and the traffic already exists, the site of a shop is fixed and the exclusive privilege of sale for drinking purposes is auctioned. Within a radius of five miles from the shop, the fermented sap of the palm may not be sold by the public except (*a*) to the licensed vendor of the shop for resale; or (*b*) to a manufacturer of molasses or palm-sugar, or vinegar, for manufacture. A Burman may possess up to four reputed quarts of *tari* and one reputed quart of country spirit within five miles radius of a shop. Beyond a radius of five miles from the shop, any one may ferment the sap and sell it to any one for any purpose, without restriction. Since legal restrictions on handling *tari* exist only within a radius of five miles from a licensed shop, the first step towards controlling consumption in any area is to establish a shop within the area.

Gross revenue. The total excise revenue on liquor rose from Rs. 6,590 in 1890-91 to Rs. 20,320 in 1906-07, and had fallen to Rs. 14,945 in 1908-09 The large increase in the period ending in 1902-03 may be ascribed in part to the creation of more licensed shops for the vend of *tari* and in part to the opening of the railway and the growth of the native-of-India population in Mônywa: but combination or the reverse amongst bidders, who are mainly Chinese or natives-of-India, is a factor which affects the excise revenue.

Revenue from *tari*. The bulk of the revenue comes from the sale of toddy shops, the number of which has varied from 11 to 13 since 1901-02. Local opinion is consulted before a new shop is opened. Temporary licenses for the sale of *tari* at festivals are also issued, on the application of licensees of existing shops. Six such licenses were given out in 1904-05 and 13 in 1905-06. Licenses for the vend of *tari* realized—in 1889-90, Rs. 2,000, in 1894-95, Rs. 4,285; in 1900-01, Rs. 9,525; in 1904-05, Rs. 13,089; and in 1908-09, Rs. 9,595. Combination of bidders at the auctions is noticed as having led to low receipts in 1903-04 and 1908-09, and illicit sale near Mônywa is said to have helped to reduce the auction value in the latter year. The licenses are usually auctioned separately.

Revenue from other licenses. The rest of the excise revenue accrues from sale of the privilege of vending foreign liquors and spirits manufactured in India according to European methods. The number of licenses has varied little; at the present time there are: one license for the vend wholesale of imported liquors and of locally produced spirits excised at the tariff rates (*i.e.*, spirit produced at large distilleries worked on European lines); and two licenses for the retail vend of the same.

There has never been a licensed distillery in the district, and there has been no licensed outstill since 1888-89.

A special Excise and Opium preventive establishment, working in conjunction with the district police authorities and under the immediate control of the District Superintendent of Police, was established in 1904. Control was transferred to the Deputy Commissioner from the beginning of 1909. The chief offences against the liquor laws are the unlicensed vend or illicit possession of *tari* and of native fermented liquors other than *tari*, *seinyè*. Illicit distillation is also detected, the number of stills suppressed in each year having been as follows, commencing from 1889-90 :—1, 0, 25, 2, 39, 11, 29, 6, 2, 2, 12, 9, 2 and, in 1902-03, 0. Other details of excise offences have been given in the preceding Chapter. Preventive staff and offences.

The district is not one of the few in which the cultivation of the poppy is permitted, and the law concerning opium is that which applies to Upper Burma generally. Except for medical purposes or under one of the special licenses issued to medical practitioners, doctors, tattooers and pharmacists, a Burman in the Lower Chindwin district may not possess opium at all. Non-Burmans may possess up to three tolas,* but must purchase it from the shop of the licensed vendor at Mônywa. Opium.

The Opium Act was brought into force in Upper Burma with effect from the 15th September 1888. Before that date the sale of opium, except to Chinese, was prohibited. The possession of opium by Burmans in Upper Burma was absolutely prohibited. Licenses for the retail vend had been granted, generally at fixed fees, and the Lower Chindwin licenses appear to have realized Rs. 250 in 1888-89. Opium administration before 1888.

A shop for the retail vend of opium was established at Mônywa in 1889-90, and the license to vend retail has been sold annually since. Purchase would, it was then thought, be practically confined to the non-Burmans in Mônywa, who were estimated to number 536 in 1890-91, and it appears to be so confined at the present time. The vend was by auction to the highest bidder : the limit of possession and of retail sale was ten tolas, or about a quarter of a pound. There was no limit to the amount of opium a licensed shop might sell in a year, and supplies of opium might be imported from the Yünnan frontier or the Shan States, in which case they paid a duty of Rs. 15 per viss of 3·65 pounds, or be purchased from the Government Treasury supply of Bengal Excise After 1888: first period:—1889 to 1894.

* 80 tolas = 1 seer = about two pounds.

opium, in which case they paid a duty of Rs. 32 per seer of about two pounds.

The quantity of opium sold from the shop was 177 seers in 1890-91; 150 seers in 1891-92; and 70 seers in 1892-93. The revenue from the vend in the same years was Rs. 3,050, Rs. 2,360, and Rs. 2,050. The decrease in sales in the last year was probably not due to diminished consumption, for in the following eleven years, when issues from the Treasury to the shop were allowed up to 120 seers per annum, the maximum amount was always taken. The decrease, coupled with a progressive decline in the fees obtained, suggests that opium was being smuggled into the district and could be obtained more cheaply illicitly than from the licensed shop.

Second period.—1894 to 1904.

New arrangements were introduced from the beginning of 1894. In order to check licensed vendors from taking out more than the local demand required, with a view to smuggling the surplus to Lower Burma, a maximum annual issue was fixed for the shops in Upper Burma. This was 120 seers for the Mônywa shop The temptation to consumers to sell such of their licit supply as they did not themselves want was checked by reduction of the maximum amount which could be sold retail and which could be lawfully possessed from ten to three tolas. The price at which the shop could obtain its supplies of foreign and Government opium remained the same, and there was, as before, no limit to the retail price at which the shop might sell to consumers. Increased attention was paid to the detection of smuggling. The vend was granted by auction as before, and realized, beginning with 1893-94—Rs. 1,900, 3,700, 3,350, 6,500, 4,050, 4,100, 5,730, 6,302, 7,035, 4,106 and, in 1903-04, Rs. 2,900.

The retail price of raw opium at the shop rose steadily from 12 annas per tola in 1893-94 to Rs. 1-5-0 in 1901-02. Beginning with 1896-97 the duty on Government opium was raised to Rs. 33 per seer and on foreign (Yünnan and Shan States) opium to Rs. 17. This accounts in part for the rise in retail price. There was a special reason—namely, the uncertainty produced by the introduction of the new arrangements into Lower Burma—to account for the drop in the vend fees in the last two years of the period. The annual reports give as a general reason for the decline in these receipts in Upper Burma in these two years the further fact that smuggling from Upper Burma to Lower Burma shops had become less easy, owing to better preventive measures. So far as the question of smuggling a

surplus supply is concerned, inasmuch as the issues at Mônywa in the succeeding period of years, when preventive measures were more stringent than ever, rose above the old maximum of 120 seers, it seems doubtful whether it was the possibility of smuggling surplus supplies to Lower Burma which led to the maximum issues being taken in the period ending with 1903-04. There were no large seizures: and the fact that retail shop prices rose with the amount payable as license fee, and the progressive increase in the license fee, suggest that, along with an effective local demand for the maximum issue, the vendor controlled all supplies and was able to fix his own retail price, and that there was not much smuggling or—if there was any—it was conducted by the vendor.

Third period—from 1904. Existing arrangements.

New arrangements came into force on the 1st April 1904. In place of the disposal of the opium shop by auction to the highest bidder—a method which, when coupled with restriction of sale to an annual maximum tempted the licensee to smuggle and sell illicitly in order to recoup his expenses—the license is disposed of, at a smaller fixed fee, to a selected vendor. This amount of issues is unrestricted, but the selling price is fixed and at a lower price than the local retail rates prevailing formerly; this is in order to induce consumers to procure their supplies from the shop instead of from smugglers. For the same purpose, the number of shops was increased, and preventive establishments were strengthened. The sales from the shop since 1904-05 have been—141 seers, 188, 195, and 168. The retail prices fixed were Re 1 for raw, and Rs. 1-4-0 for cooked opium, per tola. The increase in sales is noticeable. The maximum legal possession remains at three tolas, but, in order to check sales, the policy is, within this maximum, to restrict the amount sold to each customer to the amount he actually requires, and thus leave no surplus for hawking. The trend of the policy is exhibited in the sales figure for the last year.

The opinion of district officers is that among the Burmans of the district there is hardly any opium smoking, and this is confirmed by the small percentage of prisoners who are found on admission to the Mônywa jail to be addicted to the opium habit. A consideration of the figures collated in the preceding tables would suggest that there is not much smuggling, that sales are confined to the opium-smoking portion of the non-Burmese population of Mônywa, and that, so far as this district is concerned, the traffic has

come under control and that the habit is not spreading among the Burmans.

The village of Wayaung, on the Kyaukka plateau, contains some eighty households of tattooers, who usually anæsthetize their subjects with opium when performing the tattooing process. Only one tattooing license, in 1898-99, has been issued in the Lower Chindwin district, and the tattooers, who travel far afield, if they obtain licenses at all, obtain them in other districts. Some must omit to obtain licenses, as the number of households of tattooers is greater than the total number of tattooers' licenses issued in the province.

Gross revenue from opium.

The total revenue from opium has been—in 1890-91, Rs. 3,244; in 1894-95, Rs. 7,545; in 1904-05, Rs. 8,600; and in 1907-08, Rs. 11,420.

Other narcotics.

Ganja (hemp) is occasionally smuggled through the Post, by or rail and river, by the increasing Indian population, and it is said that morphia preparations have found their way into Mônywa.

Salt.

The salt revenue, except for a few rupees, is derived from composition duties on the soaking-beds at Salingyi, an account of which has been given in Chapter V. The revenue has been :—in 1893, Rs. 1,735; 1896, Rs. 1,520; 1897, Rs. 1,965; 1902, Rs. 2,045; 1908, 1,760.

Fluctuations have been due to two causes, namely—(1) changes in the rates of composition duty per vat, and (2) variation in the number of vats worked. The original duty, fixed in 1887, was Rs. 12 per vat, which was subsequently raised to Rs. 20, with effect from the 1st July 1890, and reduced, in September 1894, to Rs. 10 and Rs. 25, and in 1896 to Rs. 5 and Rs. 12-8-0, for non State and State vats, respectively. This explains the decrease in revenue in 1896. The increase in 1897 is attributable to a reversion to the higher rates, namely, Rs 10 and Rs. 25. An increase in the number of vats in 1900 and 1901 was neutralized by the introduction, in July 1899, of a lower rate, namely Rs. 5, which was levied on the non-State vats in Pyawbwè and Paingdaunggyi villages. At the present time, the Rs. 10 rate applies to non-State vats in other villages than the two mentioned; and the Rs. 25 rate to one State vat. The progressive decline in revenue, subsequently to 1902, has accompanied a diminution in the number of vats worked. The policy of Government is to approximate the incidence of composition duty to the incidence of the import duty on foreign salt, namely, Re. 1 per maund. The latest

Salt Administration Report—that for 1908—estimates the incidence on a maund of local salt at nine annas only, but the estimate is based on an assumed outturn which is the result of enquiry, not measurement, and is probably excessive, in which case the incidence is higher than that calculated. The fact that, whilst prices of local salt have been almost stationary since 1902, and prices of foreign salt have shown a tendency to rise, the output diminished steadily until 1907 and rose very little in 1908, which was a year of crop-failure and scarcity of agricultural means of livelihood, suggests that the owners find it difficult to engage labour and pay rising prices for firewood, and that the existing rates of duty are checking the industry.

CHAPTER XI.—Local Self-Government.

MUNICIPALITY (MÔNYWA).

[At the beginning of 1906 the Municipal Office was destroyed by fire, and with it many of the records. It has therefore been found impracticable to compile a full and connected account of the Municipality.]

The Mônywa Municipality was constituted on the 25th April 1888, under the Upper Burma Municipal Regulation of 1887. It was reconstituted on the 1st April 1905, under the Burma Municipal Act of 1898. The Committee consists of fifteen members, seven of whom are *ex-officio*, and the remainder appointed by the Commissioner, Sagaing Division. The *ex-officio* members at the present time are—The Deputy Commissioner, who is President; the Civil Surgeon, who is Vice-President; the Headquarters Magistrate; the District Superintendent of Police; the Executive Engineer; the Commandant, Military Police; and the Subdivisional Officer, Mônywa Civil Subdivision. **Constitution.**

The clerical and executive staff consists of a secretary; an overseer; 43 conservancy menials; a market overseer, with six market menials; five other menials; and two registrars of births and deaths.

The population of Mônywa, according to the census of 1901, was 7,869 persons. There were 1,248 rate-payers in the year 1907-08. **Population.**

The income has increased from Rs. 9,411 in 1890-91 to Rs. 33,269 in 1907-08; and the expenditure from Rs. 6,954 to Rs. 31,297, in the same period. In the first year of its existence the sources of income consisted of a house-tax and **Revenue and expenditure.**

market fees. In 1891-92 the Committee levied a toll on carts, whilst Rs. 7,049 was spent on public works--chiefly the construction of markets—and a beginning was made of a conservancy service. In 1895-96 expenditure on Public Works rose from Rs. 293 to Rs. 8,325, apparently on account of the construction of the Chindwin embankment. Of the increased revenue and expenditure in 1902-03 and all succeeding years, a portion is nominal, as compensating entries appear in the accounts for the purpose of exhibiting the adjustment of the moiety of the ferry-license receipts payable to the District Fund. In 1904-05 the new scavenging-tax added a small sum to incomings. In 1905-06 the Municipality was relieved of Police charges (Rs. 1,780) for the first time. In 1906-07 the new house-frontage tax enhanced receipts.

Sources of revenue and heads of expenditure.

It is mentioned that in 1893-94 a cess on the *thathameda*, or household tax, was levied, but details are wanting. The chief sources of income in 1897-98 were—(*a*) a house tax, assessed at the rate of Rs. 2 per house *per annum*, in the case of private individuals, and, in the case of Government servants and Government buildings, at the rate of one-fourth of a *pie* per square foot of the area covered by buildings Beside this tax, rent was assessed on Government land lying within Municipal limits, according to the class to which the land belonged. For first class land the rate was one rupee; for land of the second class, twelve annas, and of the third class, eight annas, for each plot of land. Presumably the basis of classification was advantage of situation, and assessment varied with the area, but this is not stated; (*b*) tolls on roads and ferries, in particular the Mônywa-Ywashe ferry; (*c*) market rents and fees; slaughter-house fees; hack-cart licenses; fees from cattle-pounds; and fines under the Municipal Act and under special laws. In the same year the main heads of expenditure were—(*a*) establishment salaries and charges of collection and audit; (*b*) Police; (*c*) conservancy; (*d*) charges in connection with the Municipal Hospital and vaccination; (*e*) charges in connection with markets, slaughter-houses and cattle-pounds; (*f*) the construction of roads; (*g*) interest on debt. [This heading has been blank since 1899-1900, when the Government loan for the construction of a central market was cleared.]

There was a separate Hospital Fund up to the close of 1897-98. On the 1st April 1898 the fund was amalgamated with the general fund, and from that date the Government grant was shown as a receipt in the General Municipal Accounts. At the close of 1897-98, the receipts from town

lands, which had been placed temporarily at the disposal of Municipalities, were resumed by Government, and compensation was given in the form of a grant. The Mônywa fund received an annual grant of Rs. 400 under this heading up to 1904-05, after which year the grant was withdrawn.

By 1902-03, the rate of assessment of the house tax on Government buildings had been raised to one *pie* per square foot *per annum* on the area covered by buildings, exclusive of out-houses, and a new heading of receipt—hackney-carriage licenses—appears in the reports. In 1903-04 a scavenging-tax, at the rate of eight annas *per mensem* per household, was sanctioned. In 1906-07 the house tax was abolished, and a general tax under the Burma Municipal Act, varying with the length of street-frontage occupied by each building, introduced; an area-tax was imposed on buildings not assessed to the street-frontage tax. There is no octroi tax. The *thathameda* collected within the Municipal area is credited to Provincial revenues.

Incidence of taxation. The incidence of the house tax per head of the population within Municipal limits was four and a half annas in 1905-06. The incidence of the street-frontage and area tax was eight annas and four pies in 1906-07, and Rs. 1-14-7 in 1907-08. The incidence is apparently calculated on the population shown at the last census and—assuming that there has been a normal growth in the population since 1901—the incidences shown for recent years are higher than actual.

The fund accounts are audited locally by the Local Fund section of the office of the Accountant-General, Burma.

Heads of revenue: market rents and slaughter houses. The system of farming the right to collect market-stall rents was abolished in 1898-99, and the rents are now collected directly by servants of the Municipality. The receipts under the heading *Markets and slaughter-houses* have risen from Rs. 8,563 in 1893-94 to Rs. 11,784 in 1907-08.

Tolls and ferries. The sale of the right to collect tolls at the Mônywa-Ywashe and Ywathit ferries is auctioned annually, a moiety of the receipts each being credited to the Municipality and the District Fund. Municipal receipts under the heading *Tolls on roads and ferries* have steadily increased. The tolls comprise a tax of two annas on each cart-load entering Municipal limits, and of two rupees *per annum* on carts owned by residents, with some exceptions. The figures have risen from Rs. 1,670 in 1893-94 to Rs. 11,090 in 1907-08.

Expenditure. The Municipality, beyond an occasional grant-in-aid, has not devoted its funds to education.

Public works. The central market has been mentioned. Until 1895-96 very little of the revenue went directly to the construction of public works, the reason being that, until a protecting embankment had been thrown up along the margin of the Chindwin—for which purpose the Municipality was husbanding its resources—the periodical flooding of the town would have rendered it a waste of money to construct roads and drains. The existing substantial embankment was commenced at Municipal expense in 1895-96 and completed in 1896-97, since which year the town appears to have escaped flooding. The embankment was strengthened in 1902-03. All roads within municipal limits, except the sections of the Alôn-Myinmu and Mônywa-Kyaukka roads, are maintained and constructed from Municipal funds. A Municipal Office was erected in 1901-02. It was burnt down—it is believed through incendiarism—in May 1906.

Conservancy. In 1895-96, the service accounted for Rs. 2,057. The service has steadily expanded since: enlarged establishment for night conservancy was employed in 1902-03, and of recent years expenditure has averaged Rs. 8,000. An outline of the system of conservancy and of the drainage—or lack of drainage—will be found in Chapter XIII. The system of private pit-latrines came to an end in April 1904. For the purpose of judging of the practicability of a regulated drainage system, levels were taken in 1900-01 and again in 1906-07, and the Sanitary Engineer and Sanitary Commissioner have prepared different schemes, but matters have not attained to the stage of a sanctioned project.

Hospital. From the 1st April 1893, the management of the General Hospital situated within municipal limits was transferred to the Committee, and a provincial grant made to the Municipal Fund. Municipal expenditure on hospitals and dispensaries has in recent years averaged Rs. 6,000. The construction of a contagious-diseases ward was commenced in 1896-97 and completed in the following year. Registration of births and deaths has been in force since May 1897, *see* Chapter XIII.

Water-supply. A description of the water-supply will be found in Chapter XIII. The town is still without a protected supply.

Precautions against fire. Half the town was consumed by fire on the 4th February 1898, and the opportunity was taken to prevent crowding of houses on re-erection and to insist on the less inflammable kinds of house material being used. Every house, other than those which are roofed with shingles or tiles, is required to supply itself with a ladder, a certain number of filled water-pots, and hooks, by means of which to tear off

the roof in case of fire. There are two small municipal fire-engines, but these have not been utilized up to the present. Small fires are of almost annual occurrence.

THE DISTRICT FUND.

Constitution.

Under an executive order of the Government of India, District Funds were established for each of the districts in Upper Burma with effect from the 1st April 1888, and certain revenues and expenditure were assigned to them. Subject to restrictions necessitating sanction of the Commissioner or the Local Government in the case of large works, the Lower Chindwin Fund is administered by the Deputy Commissioner. There is no Local Board. In general, no receipts from the municipal area of Mônywa are credited to the District Fund, nor does the Fund undertake expenditure within municipal limits.

Heads of revenue and expenditure.

The main heads of revenue are: slaughter-house licenses, cattle-pound fees and fines, and the sale-proceeds of unclaimed cattle; market rents and daily collections; cattle-market fees and fines; and miscellaneous rents, including rents from temporary trading stalls erected at some of the spirit-festivals, receipts from the lease of the right of collecting tolls at ferries, and from staging-bungalow rents. There is no cess on the land-revenue or *thathameda*. The main heads of expenditure are: the establishments connected with pounds, slaughter-houses, markets and bungalows; conservancy in rural areas; and public works. Until the end of 1905-06 the Fund also paid for certain district *dâk*, or postal, lines in rural areas, *vide* Chapter IX.

Public works.

If the project or maintenance scheme is a large one—the dividing line is ordinarily drawn at projects costing Rs. 2,500—a sum is transferred to the Public Works Department (District Fund) Budget, and the work is carried out through the agency of the local office of the Public Works Department. If the project is a small one, it is carried out by the Deputy Commissioner, assisted by a subordinate staff under the immediate supervision of a District Fund overseer. The public works on which the Fund incurs expenditure are: roads, district and *dâk* (staging) bungalows (*vide* Chapter IX); arboriculture, in the shape of the planting of roadside trees; cattle-pounds, markets and slaughter-houses; improvements to the water-supply, effected by excavating or improving tanks and assisting village irrigation works.

There are at the present time thirty-one cattle-pounds, two markets (at Satôn and Salingyi), nine slaughter-houses, fourteen ferries, one *dâk* bungalow (at Mônywa), and eight district bungalows. The most important of the ferries is that connecting Mônywa and Ywashe, *vide supra*. The Fund also supervises cattle-markets at four places, Alôn, Budalin, Salingyi and Palè.

Establishment. The establishment of the Fund is, at the present time, 24 cattle-poundkeepers; two market overseers; two market menials, one District Fund overseer, with two menials, one *dâk* bungalow cook, and eight attendants at district bungalows.

Revenue and expenditure. The revenue has increased from Rs. 5,374 in 1890-91 to Rs. 30,317 in 1907-08; and the expenditure from Rs. 2,022 to Rs. 23,518 in the same period.

The revenue in the later year included, however, a grant from Provincial revenues of Rs. 12,500. Excluding receipts from Provincial grants, there has been a progressive increase from 1901-02, and this is attributable to steady growth in the receipts from slaughter-house licenses and cattle-pound fees. Market rents have shown a tendency to fall, and receipts from the lease of tolls and ferries are rising, but with no great rapidity.

On the expenditure side, all available funds go to public works of the kinds already noticed. The Fund has not, up to the present, helped education, and there has been no expenditure on Medical services since 1892-93.

CHAPTER XII.—Education.

Literacy: census figures of 1901. The population of literates was in 1901—

Males	...	407 to every thousand males.
Females	...	18 to every thousand females.
Both sexes	...	189 to every thousand.

The corresponding figures for the dry-zone portion of Upper Burma (excluding the urban area of Mandalay) were males, 446; females, 23. The literacy of the district is therefore apparently slightly below the average of the dry zone, but there is reason to think that many of the scholars in monastic schools have been recorded as illiterate. The figures of literacy are slightly above the average of the whole of Burma. The literate figure per thousand was, by

localities—Monywa town, 204; Salingyi township, 211: Palè, 191; Mônywa, 179; Kani, 179; and Budalin, 177.

Of the rural areas, literacy appears to be most widely diffused in the Salingyi township, the figures of male literacy for which area are better even than those for Mônywa town. The classification followed at the previous census of 1891 was into *learning, literate* and *illiterate*, and the district figures were, per thousand males—learning, 73; literate, 371; total 444. There was in the decennial period an apparent decrease in the literacy of males, but the Census Report of 1901 explains that comparison of the two results requires to be made with caution, owing, among other reasons, to the difference in classification. It appears probable, from an examination of the *literacy by age-period* figures, that the *learning* category of 1891, *i.e.*, scholars in monastic schools, may have been generally recorded as *illiterate* in 1901.

Administration.

The district forms a sub-circle of the Northern Educational Circle, and a Deputy Inspector of Schools is stationed at Mônywa, with a staff of one clerk and one menial. He is assisted by six itinerant teachers—one for each of the five civil townships, and one for Mônywa town.

Primary education in Public schools.

There are 158 Public Primary Schools. The aggregate attendance at the annual inspection of 1908-09 was—male scholars, 2,688; female, 1,171. The number of schools and of male scholars in that year fell below the numbers reported in 1890-91, the year in which the first return was submitted (346 schools: 4,619 scholars); but in the early years the Chindwins formed a single educational charge, and the reported figures were for the two districts together. The succeeding years show a steady diminution down to 1899-1900, when the numbers began to rise (105 schools: 1,517 male scholars), and have continued to rise since. Other causes of the diminution in the middle period were increasing stringency in the test required before a school could be registered, and the substitution as the examining agency of the Education Department for the school managers.

The monks in charge of monastic schools often demur to obtaining registration, on the ground that the superior ecclesiastical authorities do not favour it. The fact that registration, except in special cases, carries with it the obligation to teach to a prescribed curriculum no doubt also deters the scantily-educated among them. Moreover, the incentive to registration of new schools rests in the main with the Deputy Inspector or the itinerant teachers, and these

officers are unable to visit all the indigenous schools. There is a generally-expressed opinion that the local ecclesiastics view the system of English education with disfavour, and this view appears to receive some support from the statistics. As elsewhere in Burma, the number of females receiving education has increased steadily, and the chief impediment to a more rapid increase is stated to be the dearth of trained mistresses.

Unregistered private schools.

The number of unregistered private schools, *i.e.*, schools which need not teach to a curriculum and which, on the other hand, are not eligible for grants-in-aid, is stated to be 834, with an attendance of 5,990 male, and no female scholars. Whilst the number of schools has increased steadily, the attendance figures exhibit wide fluctuation from year to year. The figures of attendance in these schools are, however, an approximation only, derived from such reports as may reach the Deputy Inspector. The reported number is probably below the truth. The number of villages in the district exceeds 1,000, and each village has at least one monastery; many have several, and the number of scholars who are receiving instruction in the rudiments of learning must be great. The attendance reported to officials is usually that found in the cold weather, when the Deputy Inspector and itinerant teachers conduct their tours, and the attendance of scholars at that season is lessened owing to harvesting operations. Practically all the private schools are monastic. Very occasionally, a private lay school is opened, but such schools seldom endure for long. They are said to be opened sometimes from motives of rivalry felt towards—and in order to detach scholars from—a neighbouring school which has accepted registration and Government aid; and instances have occurred where the pseudo-manager has inaugurated a school in order to benefit by the exemption from the household tax accorded by Government to schoolmasters.

Secondary education in Public schools.

There are five schools graded as Middle schools, and the total attendance at the date of the annual inspection of 1908-09 was—males, 312; females, 68. The number of schools and of pupils has increased, the figures in 1893-94—the first year for which returns were submitted—having been: number of schools, 2; male scholars, 133; female, *nil.* The schools are the Wesleyan Mission School and one monastic school at Mônywa; the Government Vernacular Model school at Alôn, and two indigenous girls' schools at Mônywa.

Mission education.

The English Wesleyan Mission Middle School is the largest and most important school in the district. The

following account of the schools of this Mission has been supplied by the Rev. E. J. Bradford :—

"The Mission undertakes Anglo-vernacular, vernacular, and female education. Anglo-vernacular education was commenced in Mônywa town in 1892. A small school was opened in a rest-house as a branch of the Anglo-vernacular Mission School at Pakôkku, a Burmese assistant master being placed in charge, supervised by the missionary resident at Pakôkku. Within a few months an English missionary was stationed at Mônywa and the work placed on a proper basis. The school soon won its way to favour and, as the practical value of English letters became obvious, all who could afford to pay sent their children to learn English. The numbers on the register have grown from 15 in 1892, 45 in 1897, 84 in 1902 and 136 in 1906, to 183 in 1909, and the school was officially classified by the Inspector of Schools at the close of 1908 as " one of the most efficient schools in the Northern Circle. There is an hostel attached to the school, in which 40 boys find accommodation. They are drawn from the Upper and Lower Chindwin districts, as far north as Homalin. Government in 1906 sanctioned the raising of the school from the Middle to the High Grade.

Vernacular mixed schools are maintained at Shaukka near Mônywa, in Mônywa town, at Kanbya, and at Lèzin.

A girls' school was opened at Mônywa in 1900. Judged by educational results, the school has been very successful. It teaches to the seventh standard: needlework of all kinds and singing are taught, in addition to the ordinary Government vernacular curriculum. The school has an attendance of between 40 and 50 girls.

The schools of the Mission have risen from 1 to 6, and the number of scholars from 26 to 341 since 1893."

Expenditure on education.

The amount expended in the district on education in the three years ending with 1908-09, exclusive of direction charges, was—Rs. 15,355, 18,363, and 21,985.

The expenditure on Anglo vernacular Secondary education (results-grants) averaged Rs. 1,200, in the five years ending with 1908-09.

The bulk of the expenditure has been on vernacular and, for the most part, Primary education, and in the shape of results-grants. The figures have risen from Rs. 4,092 in 1902-03 to Rs. 11,154 in 1908-09.

Technical and other grants to vernacular Primary schools cost Rs. 2,631, and to vernacular Secondary schools Rs. 976, in 1908-09. In preceding years there had been little expenditure under this head of vernacular education.

Survey school.

There is a Government Survey School, in Mônywa, for the purpose of imparting instruction in surveying.

General remarks.

The outstanding features of education in the district are at present—

(*a*) the steady growth in female education;

(*b*) the success of the Wesleyan Mission Anglo-vernacular Middle School.

There is little to show that the primary education of males in supervised institutions is becoming more sought after by the people.

CHAPTER XIII.—Public Health.

[From material furnished by Mr. W. St. M. Hefferman, Civil Surgeon, Mônywa.]

Burmese surgery.

The practice of surgery among the Burmans in the Lower Chindwin district, as in other parts of the province, is still primitive. Beyond the opening of small abscesses and the setting of fractures, they can perform no surgical operations. Abscesses are generally opened with one or other of the following instruments:—

(1) A clasp knife. (3) A heated needle.
(2) A razor. (4) A broken piece of bottle.

Proper lancets are unknown: after the matter has been let out, a piece of twisted thread is inserted to act as drainage. As a rule, however, the opening for drainage is not large enough, and in consequence quick healing is retarded. Attempts are sometimes made to eradicate tumours by the application of escharotics, and this generally results in the formation of foul-smelling ulcers. The ingredient chiefly used consists of sulphate of copper or crude arsenic, with a base of wax or fat. The setting of fractures of bone is also undertaken. Rough splints, made of spliced bamboos matted with strings, are applied round the limb over the seat of fracture and tied with pieces of cloth. Charmed oil (sweet oil) is then poured over the injured limb until the fracture is set. As a rule, the tying is so firm as to cause impediment to the circulation, resulting in the formation of blisters, and in some cases gangrene of the limbs sets in. In fracture of bones of the lower extremities deformity generally results, such as shortening or curvature of the limbs.

Herbs, roots and fruits are used in the form of boluses and rough powders for all ailments. The native practitioners of the present day collect their ingredients from shops in the markets (*para-sesaing*). The roots, etc., are always old and mouldy, and the doctors generally have no knowledge of their therapeutic value. The shop-keepers from whom they purchase seldom keep genuine medicines. The older school of doctors as a rule picked fresh herbs in the jungles and prepared the medicine themselves. There are two schools of physicians: the first—*beindawsaya*—prescribe medicines; the second—*datsaya*—administer no medicines, but treat patients by diet alone; certain animal and vegetable foods are given in rotation, a certain number of days being fixed during which each article of diet prescribed must be taken. The diseases in which the dietary method is generally applied are chronic diarrhœa and uterine disorders. No specially noteworthy indigenous methods are applied, whether in surgery or physics. Diseases like syphilis and yaws are treated by means of crude preparations of mercury, in many cases with great damage to the patients. **Indigenous medicines.**

There are Civil and Military Police Hospitals at Mônywa, each with 32 beds. The average monthly attendance at the Civil Hospital in 1908 was—indoor patients, 28: outdoor, 42. The average of operations was 26. There are Civil Dispensaries at Yinmabin and Budalin. **Hospitals.**

The number of Hospital Assistants employed is four: one each at Mônywa, Yinmabin and Budalin, and one on special duty for the treatment of yaws.

The old Civil Hospital at Mônywa, opened in 1887, was situated near the present Civil Police lines and had accommodation for 20 patients. It was dismantled when the present building was occupied in 1896. The cost of construction of the hospital was borne by Government. An operation building, with accessory rooms, is in course of construction. Funds for this work were allotted by the Municipality, Government also assisting. The erection of a new outpatient department has also been sanctioned and funds provided. **The Mônywa Municipal Hospital.**

There is a separate section with six beds, reserved for female patients. The attendance, both indoor and outdoor, has grown steadily. Additions to the inferior hospital staff have been made from time to time, and it now consists of a nurse, a female ward-servant for females, three male ward-servants, and four menials.

No portion of the pay of the Civil Surgeon or the Hospital Assistant is charged to the Municipality. The

income in 1907 was Rs. 6,090 and the expenditure Rs. 6,336.

In the early years the income consisted for the most part of grants from Government; at the present time the major portion of the receipts is from Municipal contributions. There is no Municipal Hospital cess, but a varying grant is made annually.

The Civil Dispensary at Palè, opened in 1896, was closed in 1901 and reopened in Yinmabin, owing to the change of the headquarters of the Civil subdivision. At both Yinmabin and Budalin the dispensaries are for outdoor patients only; at the latter place the dispensary has recently been made permanent.

Chief diseases: cholera.

The chief diseases are malarial fever, dysentery, worms, diseases of the eye, and endemic yaws. Small-pox and cholera occur in epidemic form in most years, especially cholera, which has attacked the town of Mônywa seriously not less than seven times within eleven years, and lately for three consecutive years, each epidemic costing from 80 to 90 lives. Although the headmen of outlying villages have been instructed in the measures of segregation which should be taken on the occurrence of disease, there is no doubt that in rural areas outbreaks are frequently not reported. Within Mônywa town outbreaks cannot be concealed, and active measures are practicable. These have consisted in the disinfection of houses with solution of perchloride of mercury, and of wells with potassium permanganate, the burning of infected bedding and clothing, the supervision of food-supplies within the market, and protection of them from contamination by flies; the inspection of houses in which aërated water or bread are prepared; the provision of boiled water free within the town; and prohibition of drawing water from the margin of the Chindwin river. These measures have, up to the present, failed in efficacy, mainly owing to the apathy or active distrust shown by the people, and, for the town of Mônywa, a protected water-supply is under consideration.

Malarial fever.

The indigenous treatment of malarial fever is often with *nandôk* or *ngansi*, one of the ingredients in which is said to be the seed of the *samônnet*, a kind of anise. It is frequently mixed with quinine. All types of malarial fever are found in the district, but the severe (malignant tertiary) cases come from Kani and the northern regions. The disease yields to the ordinary quinine treatment. Sale of quinine is effected through the Post offices, by the vaccinators in their tours through the district, and by Township

Officers. Until recent years, more sales were effected by vaccinators than by the other two agencies, but sales from the Post office are now rising and have been in the last three years, in large packets of 102 grains each—1906, 10; 1907, 51; 1908, 90. The total sales by all agencies have risen from 36 packets in 1900 to 114 in 1908.

Yaws: frambœsia. The only special disease of importance is yaws, which is endemic in the greater part of the Lower Chindwin. It has been reported upon by Military Assistant Surgeon McCarthy, late Civil Surgeon, Mônywa. The similarity of the symptoms to those of syphilis, and the identity of the curative methods employed, are noticeable. A Burmese Hospital Assistant is employed specially for duty in connection with this disease. He travels from village to village distributing medicines, and has succeeded in combating the disease to a great extent. It is understood to be the intention of Government to depute a trained parasitologist to investigate the disease, which is most prevalent in the Kani and Budalin townships.

Plague. The district has enjoyed, up to the time of writing,* practical immunity from plague. In the three calendar years 1906 to 1908 there were 24 cases admitted to the Mônywa hospital, 20 of which terminated fatally. The monthly distribution has been—in the month of February four admissions, of March eighteen, and of April two. All the cases were imported, ten of them from Mandalay.

Vaccination. Vaccination was introduced into Mônywa town and district in 1888. The Vaccination Act was brought into force in Mônywa in 1893. The figures of successful vaccination have risen from 960 in 1890-91 to 14,092 in 1908-09. In Mônywa the number rose from 238 to 435, between 1899 and 1907. The vaccination staff has steadily grown. At first there was a single vaccinator for the town and district. In 1893 one vaccinator for the Municipality was, and is still, employed, and two for the district. Since 1901, five rural vaccinators have been employed, one for each township. A Native Superintendent has been employed since November 1906. The cost of operations has risen from Rs. 269 in 1890-91, Rs. 949 in 1896-97, and Rs. 1,619 in 1903-04, to Rs. 2,871 in 1907-08. The percentage of successful operations to the whole number of operations was 95 in 1907-08. Lymph is supplied by the vaccine depôt at Meiktila. Vaccination has been accepted

* There has been a severe outbreak since.

willingly. Some opposition was experienced in 1905, when plague broke out in the province, and in subsequent years, but it was confined to a few places, and is attributable principally to rumours, spread by ill-disposed persons, that inoculation for plague was to be substituted for vaccination. During the last ten years, the occurrence of the practice of inoculation against small-pox has been reported twice only: once in 1901, from Ngayaho village on the Mu river, and from Zipani the south-west of Salingyi township, in 1907.

Water-supply and sanitation. In Mônywa Town.

Little improvement has been made in the sanitation by the district, while Mônywa town is yearly menaced of cholera owing to a contaminated water-supply, namely, the Chindwin river. A protected pipe system has, however, been discussed and decided upon, and Government have contributed a grant of Rs. 30,000 towards the project. The existing water-supply is derived mainly from the Chindwin river, which is constantly fouled by the riverine villages above Mônywa. During the high-water season, the water is charged with silt and becomes turbid, and is decanted from pots after the sediment has settled. There are nine public and fifty-two private wells in the town. Of these, five only contain fairly potable water; the water of the remainder is brackish and cannot be used for drinking purposes. In the Civil Station and the Military Police lines there are four wells which contain good drinking-water Good water is also obtained from six wells situated outside and to the east of the town, about one-and-a-half miles away. This water is used by about eighty-five per cent. of the population when the river is in high flood.

The main supply being derived from the river, prevention of pollution is impossible. The water is carried, mostly by women, in earthen water-pots and is stored in the same kind of receptacle inside the houses. Usually the supply is drawn from the margin of the river. The system is obviously unsafe and insanitary. In the hot weather, when the river is low, islands are exposed and the eastern marginal waters stagnate, as the stream for some years past has followed the opposite or western bank. At the close of 1907, the marginal backwater was bridged in numerous places, in order to enable the people to draw their supply from the flowing stream, but, as mentioned above, complete supervision is impracticable and there have been recurring epidemics of cholera.

About one-third of the town is on a lower level than either the region near the river bank or the eastern and

northern parts. Storm water flows from the higher levels into this area, which in turn drains into large excavations. Water accumulates in these during the rains, becomes stagnant, and gradually disappears by evaporation and absorption. Only one large masonry drain exists, leading from the Jail through the Military Police lines. Sulliage from houses, owing to the want of proper drains, is thrown into the kennels, where the liquid portion becomes absorbed, whilst the dry residue is blown about in the vicinity of house-enclosures. No recommendations for the improvement of the drainage have been made, but levels were taken, with a view to an ultimate drainage system, in 1901 and 1907. There are six pairs of iron Horbury Patent latrines in public use, and the pan system of private latrines was introduced in April 1904, when private pit-latrines were closed. The only places now using cess-pits are the numerous Buddhist monasteries. Private conservancy is undertaken by the Municipality, which assesses a special scavenging-tax for the purpose. Conservancy is effected in Crowley carts, the ultimate process being dry-earth trenching outside the town limits. Day conservancy is also carried out by the Municipality with an establishment of eleven dust-carts, and there are sixty public dust-bins placed along the roadsides.

In rural areas.

All villages situated on or near the Chindwin obtain their supply from the river. The inland villages draw their water from wells and tanks, or from shallow holes dug in the dry beds of streams and filling by percolation. In most instances wells are protected with parapets and a platform, and are lined either with masonry or timber, or both. The position of wells in relation to sub-soil pollution is generally defective. They are either inside the villages or in low ground outside, where surface drainage from the village lodges. In a few villages wells are kept fairly clean, but in the majority the surroundings are dirty, and the spill from the water drawn forms a puddle. In parts of the Budalin, Kani and Salingyi townships, water is scarce in the hot weather and has to be carted from a distance. Tanks, by which term should be understood simple, excavated depressions or ponds, are neglected ; they are almost invariably open to animal and vegetable contamination. It is the exception to find one protected with wooden railings. The Sanitary Commissioner, Burma, has recently recommended the introduction of Abyssinian tube wells, and sixteen riverine villages have been provided with these wells, thirty-four in all. They have in most instances been sunk in

the sandy bed of the river, at convenient distances from the villages, and are freely used.

There is no artificial drainage in the rural areas. Many village-sites lie low and become swampy during the rainy season. In the great majority, domestic cleansing and conservancy are in a primitive condition. Rubbish is thrown outside the village fence, and is only used for the purpose of manuring land when the immediate vicinity of the site is under cultivation otherwise it remains where it is thrown, and is seldom burnt. In large villages along the main routes, house-enclosures are kept fairly clean : in the remainder, little attention is paid to cleanliness. Penning cattle within the village-enclosure is a universal practice. The accumulated ordure is removed only once in the year, at the beginning of the cultivating season, and in the rains the byres become evil-smelling beds of slush. The accumulation steadily rises and, becoming desiccated in the hot weather, is blown about. The byres are doubtless contributing factors in the causation of disease, more especially of small-pox, which is essentially a disorder brought by filth. There are no private or public latrines in rural areas except at Budalin. Resort is had to the bush growth outside the village fence until the gates are closed at sunset, when the village area and its surrounding fence are visited.

The introduction of correct sanitary methods throughout rural areas is now and—it is to be feared—must remain impracticable. The prevalence of dacoity and cattle-theft in the previous generation, and the risk of attack from wild beasts, have made the people averse from leaving cattle outside the villages at night, so that the byre would appear to be a necessary evil. The suggestion has been made that conservation of at any rate the village-site might be secured without the opening of the gates at night, by the introduction of moveable cess-pit latrines. The doubt may be expressed whether such a measure would prove successful in practice, disregard of sanitation being ingrained in the people.

Vital statistics. The registration of vital statistics in the rural areas began in January 1899, deaths only being recorded. The registration of births was brought into force in January 1907. In Mônywa, the registration of births and deaths began on the 13th May 1897. Births rose from 111 in 1897 to 286 in 1908, and deaths from 137 to 200. The opinion is expressed that registration in Mônywa town is carried out with a fair degree of accuracy. Deaths in the

rural areas rose from 4,486 in 1899 to 6,743 in 1908, in which year 9,955 births were reported.

Owing to the ignorance of village headmen, the classification of the causes of mortality in rural areas cannot be relied upon ; in Mônywa, where the classification may be accepted as substantially correct, the chief causes have been cholera, fevers, and respiratory diseases. The ratio, at Mônywa, of deaths per thousand has been, since 1899—54, 26, 27, 31, 42, 26, 43, 39, 36 and, in 1908, 25.

The true ratio is no doubt less than that exhibited in recent years, as no allowance has been made for increase of population since the census of 1901.

CHAPTER XII.—Minor Articles.

Mônywa Town.—The headquarters of the Lower Chindwin district, situated in 22° 6′ N. and 95° 8′ E.; on the left or eastern bank of the Chindwin river, about fifty miles north of its point of junction with the Irrawaddy, and sixty-five miles west of Sagaing, with which it is connected by a branch line of railway. The town, which is low-lying and well shaded by tamarind and other trees, is protected from the annual rise of the river by an embankment along the water's edge. The high road from Sagaing and Myinmu to Alôn and Ye-u, in Shwebo, traverses Mônywa. A list of the public buildings has been given in Chapter IX; all are situated at the northern end of the town. The railway station is about a mile from the river on the east. The few private residences and a club are situated in or near the civil station, which skirts the river on the north of the town. The legend of the origin of the name has been noticed in Chapter II. The town was of little importance in Burmese times, the headquarters of the Burmese Governorship being at Alôn, about seven miles further up the river, and the headquarters of the British district were not changed to Mônywa until 1887. The town contained at that time 345 houses, and the population may have numbered 2,000 souls. In the census year 1891 it was 6,316, and in 1901 had increased to 7,869, with more than a thousand natives of India. The town is divided into two quarters, Hlegu in the north and Mônywa in the south, and each is divided into wards for purposes of administration. Mônywa is a thriving trade centre and is one of the chief ports of call for river steamers on the Chindwin. The town is well laid out and is intersected by good thoroughfares. An account of the Municipality has been given in Chapter XI, of the medical and sanitary arrangements in Chapter XIII and of the Wesleyan Mission Middle School in Chapter XII.

Mônywa Subdivision.—One of the two subdivisions of the district, comprising the Budalin and Mônywa townships. Its headquarters are at Mônywa. The boundaries of the subdivision are—on the east, the Mu river, for some 20 miles in a direct line south from a point a little north of Baunggya village; on the south, the district border with Sagaing, a line which traverses natural features in a westerly direction to the Chindwin river; on the west the Chindwin, as far as Chaungwa village between Shwezayè and Kanè, and thence an ill-defined line following the general direction of the

drainage in a northerly direction past the Natyedaung hills to the Shwebo border, and traversing the southern slopes of the Hnaw forest; on this side the subdivision marches with the Salingyi and Kani townships of the Yinmabin subdivision ; and on the north, the district boundary with Shwebo. This also is an ill-defined line and, about midway in its course to the Mu, a wedge of the Shwebo district intrudes south for some miles between flanking portions of the Lower Chindwin district. The subdivision corresponds approximately with the Alôn Governorship of Burmese times. The area and population by census have been—

Year.	Area in square miles.	Total population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	938	122,818	52,219	70,599	121,834	68,943
1901 ...	938	145,611	62,221	83,390	144,004	77,764

The preponderance of females has received comment in Chapter III. The figures of cultivation have been as follows :—

Year.		Acres cultivated.
1903-04	...	... 238,566
1907-08		... 234,376

The land-revenue and *thathameda* collections together rose from Rs. 2,56,649 in 1902-03 to Rs. 3,17,895 in 1906-07.

Budalin Township.—The north-eastern township of the Lower Chindwin district, lying on the east of the Chindwin river between 22° 14′ and 22° 37′ N., and 94° 56′ and 95° 35′ E., and having an area of 451 square miles. The township was formed in 1894 and comprises the whole of the old Kudaw township, together with the northern villages of the old Ayadaw township, that is, the northern half of the Kyaukka-Mu plateau. The boundaries of the township are—on the east, the subdivisional boundary, the Mu river, for a distance of about twelve miles south from Baunggya, near the Shwebo border ; on the south, an irregular line, approximately bisecting the Kyaukka-Mu plateau and, west of the Kyaukka ridge, traversing the Kyaukka-Chindwin valley to a point a few miles north of Alôn on the Chindwin, and separating the Budalin from the Mônywa township ; on the west and north the subdivisional boundary, *vide Mônywa*

Subdivision. The headquarters station is Budalin, an inland village twenty miles north of Mônywa. The population and area, by census, have been—

Year.	Area in square miles.	Population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	451	50,847	21,305	29,542	50,687	28,217*
1907 ...	451	55,447	23,168	32,279	55,384	36,743

* Figures approximate only.

The area cultivated was 116,291 acres in 1903-04 and 117,627 acres in 1907-08. Land-revenue contributed Rs. 136 in 1902-03 and Rs. 60,838 in 1906-07; *thathameda* contributed Rs. 1,00,731 in the former year and Rs. 72,638 in the latter. The increase under land-revenue and the decrease under *thathameda* were caused by the imposition of acre-rates on non-State land and the reduction of the general *thathameda* rate at Summary Settlement. The township is for the most part high-lying, but there is low ground on the south-west: near the Shwebo border, east of Kudaw, there is a fairly level stretch of rice land, assisted by small irrigation works. There are conspicuous hills in the north-west, near Natyedaung and Twin, the latter an extinct volcano with an explosion-crater containing a lake; the continuation of the Kyaukka ridge divides the township and finally loses itself in the slopes of the Hnaw forest of Shwebo and, off this ridge, at Ôkpo, there is a prominent elevation. The only perennial stream in the township is the Ye-ngan (*sc.* brackish) stream, which rises in a marsh near Yèdwet village on the north. Its waters are slightly saline.

Ayadaw.—A village in the south-east of Budalin township, in the centre of the Kyaukka-Mu plateau. The population was estimated at 1,491 persons in 1896-97, 2,134 in 1901 and 2,187 in 1906-07. The village lies high and during the hot-weather months water is scarce, as percolation and evaporation diminish the supply in the tanks. Most of the villagers are cultivators, but there are some blacksmiths and potters and a good many makers of bamboo battens. The village was the headquarters of the Ayadaw township until 1894, when that township was absorbed, *vide* Chapter IX. The Government buildings are a Civil Police station and a Public Works Department inspection

bungalow. The main road from Kyaukka to the Mu traverses Ayadaw.

Budalin.—The headquarters station of the Budalin township, situated on the Mônywa-Ye-u road, twenty miles north of Mônywa. The population was estimated at 2,611 in 1896-97, 2,577 at the census of 1901 and 2,366 in 1906-07. The water-supply in the hot months was scanty in the early years after annexation, but a tank of some size was improved at Government expense, and this now provides a sufficient supply. The Government buildings are the Township Officer's court-house, a Civil Police station and a Public Works Department inspection bungalow.

Kanbyu.—A village in the south-east of Budalin township. The population was estimated at 1,285 persons in 1901 and 1,059 in 1906-07.

Kinzan.—A village in the north of Budalin township, a few miles east of Kudaw. The population was estimated at 659 persons in 1896-97 and 1,026 in 1906-07. Agriculture is the only occupation.

Maungdaung.—A village seven miles north of Budalin in the Budalin township, with an estimated population of 1,956 persons in 1901 and 1,979 in 1906-07. The village makes lacquerware, especially the low tray on a circular stand known as *daunglan.* The festival of the Kwandaung pagoda is held in December.

Naunggyi-aing.—A village situated a few miles north of Ayadaw, in the north of Budalin township, with an estimated population of 1,365 persons in 1901 and 1,606 in 1906-07.

Ngapayin.—A village in the north of Budalin township, situated to the east of Kudaw village and adjoining an extensive stretch of rice cultivation. The population was estimated at 2,050 persons in 1901 and 2,178 in 1906-07. The village was the birth-place of Maung Yit, better known by his title of Maha Bandula, the commander of the Burmese forces in the first Burmese war of 1826. He was killed at Danubyu.

Nyaunggan.—A village five miles south-west of Budalin. The estimated population in 1901 was 1,293 and in 1906-07 1,321; the village contains a number of carpenters. Nyaunggan lies near the northern edge of the black-soil region east of the Chindwin river, and to the north the level of the country rises rapidly.

One mile south-west of the village is a shallow explosion-crater without a lake, and four miles further in the same line is the crater of Twin, east of the Chindwin, *vide*

Chapter I. This has a circular basin two thousand yards in diameter and three hundred feet deep, and contains a lake three-quarters of a mile wide. The lake has a greatest depth of one hundred and eight feet: the water is bright green in colour and is said to be impregnated with sulphate of soda. Shocks of earthquake are stated to be of frequent occurrence within a radius of eight miles from Twin. The insect known as the *twin-po* is found in the lake. The village of Twin, situated on the margin of the lake, is said to suffer from a kind of skin-disease resembling leprosy [probably yaws (frambœsia), *vide* Chapter XIII].

Yèdwet.—A village in the north of Budalin township, near the Shwebo border. The estimated population in 1906-07 was 1,389 persons. East of the village is a marsh from which flows a small perennial stream. The water is brackish, but is diverted for purposes of irrigation, and supplies a certain crop of indifferent rice. Much of the soil near Yèdwet is alkaline. The village makes unglazed earthen pots on a considerable scale.

Mônywa Township.—The south-eastern township of the district and one of the two townships of the Mônywa subdivision, lies between 21° 55′ and 22° 21′ N. and 95° 3′ and 95° 39′ E. It is bounded on the north by the Budalin township, *q.v.*, on the east by the Mu river, on the south by the Sagaing district, and on the west by the Chindwin river, *vide Mônywa subdivision*. The township in its present form dates from 1894, when it absorbed the southern half of the old Ayadaw township.

The eastern half of the township forms the southern half of the Kyaukka-Mu plateau and is high-lying and broken. West of the Kyaukka ridge the country is a low-lying plain, watered by the torrents which descend from the east, and in the south-west by inundation from the Chindwin. There is no perennial stream. The headquarters are at Alôn, the terminus of the Sagaing-Alôn branch of the Burma Railways. The population and area, by census, have been—

Year.	Area in square miles.	Population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	487	71,971	30,914	41,057	71,147	40,726*
1901 ...	487	90,164	39,053	51,111	88,620	41,081

* Figures approximate only.

The area cultivated was 118,480 acres in 1891 and 116,749 acres in 1901. The land-revenue collections amounted to Rs. 52,7·2 in 1902-03 and Rs. 73,238 in 1906-07, and the *thathameda* to Rs. 1,03,060 in 1902-03 and Rs. 1,11,181 in 1906-07.

Several important local industries occur in this township, *e.g.*, the manufacture of saddles at Kyehmôn, sandals at Kanbya, clogs or pattens at Kyehmôn, brassware at Indaing, combs at Lèzin and a neighbouring village, Thekkè-gyin, lacquer at Kyaukka, and bamboo plaiting at Kawè-gyin, and there is a good deal of annual emigration.

Alôn.—The headquarters of the Mônywa township, situated seven miles north of Mônywa on the left bank of the Chindwin river. The population of Alôn, with Kônyat, an adjoining hamlet, was estimated at 2,923 persons in 1906-07. The town lies on the main road connecting Sagaing and Mônywa, with Ye-u in Shwebo district, and is the terminus of the Sagaing-Alôn section of the Burma Railways. Alôn was in Burmese times the headquarters of the *wun*, or Governor, of the Alôn *nè*, the Burmese administrative district, *vide* Chapter IX. An account of the Alôn spirit-festival is given in Chapters I and II.

Indaing.—A village about ten miles north-east of Mônywa in the Mônywa township. There is an extensive industry in wrought brasswork, particularly gongs, for which the village has more than a local reputation. The population was estimated at 905 persons in 1891 and at 1,118 in 1906-07.

Kothan.—A village seven miles north-east of Mônywa in the Mônywa township. The population was estimated at 1,321 in 1891, 1,109 in 1901, and 1,403 in 1906-07. A small amount of silk-weaving is carried on.

Kyaukka North.—A village situated on the Mônywa-Mu road, at the foot of Kyaukka hill, ten miles east of Mônywa in the Mônywa township. The population, which was estimated to number 1,320 persons in 1901 and 1,495 in 1906-07, is largely occupied in the manufacture of bamboo-lacquer: the industry is described in Chapter VI. The festival of the Shwekuni pagoda takes place in May.

Kyauksitpôn North.—A village six miles north-east of Mônywa in the Mônywa township. The population was estimated at 1,028 persons in 1901 and 1,074 in 1906-07.

Kyehmôn.—A village on the Mônywa-Myinmu-Sagaing road, with a railway station, ten miles south of Mônywa in the Mônywa township. The population was estimated at 1,521 persons in 1890-91, 1,737 in 1901 and 1,965 in 1906-07. There are several industries, of which the most important

is the manufacture of Burmese saddles and their appurtenances, *vide* Chapter VI. Other industries are the manufacture of Burmese sandals and small articles of brassware.

Lèzin.—A village four miles south-east of Mônywa in the Mônywa township In 1891 the population was estimated at 921, in 1901 at 1,160 and in 1906-07 at 1,098 persons. The village manufactures ornamental hair-combs, *vide* Chapter VI.

Malètha.—A village near the Sagaing border, in the south of the Mônywa township, about thirty miles east of Mônywa. The population was estimated at 851 persons in 1891, 1,152 in 1901 and 1,229 in 1906-07. The village lies in the south of the Kyaukka-Mu cotton country.

Minywa.—A village in the south-east of the Mônywa township, some thirty-two miles east of Mônywa. The population was estimated at 1,093 persons in 1906-07. The road from Ayadaw in the centre of the Kyaukka-Mu plateau to Myinmu in Sagaing district passes through this village.

Mônywe.—A village situated on the Mônywa-Myinmu-Sagaing high road, not more than a stone's throw distant from Kyehmôn village in the south-east of the Mônywa township. The population was estimated at 1,357 persons in 1891, 1,298 in 1901 and 1,524 in 1906-07. Besides the industries mentioned under Kyehmôn, the villages in this circle make Burmese mattresses and cushions.

Myobaw.—A village ten miles north-east of Mônywa in the Mônywa township. The population was estimated at 969 persons in 1891 and 1,098 in 1906-07. There is no special handicraft.

Ngwèdwin.—A village in the north-east of the Mônywa township near the Mu river. The population was estimated at 1,090 persons in 1901 and 1,297 in 1906-07.

Nyaungbyubin.—A village situated on the Ywathit inundation outlet of the Chindwin river, six miles south of Mônywa, in the Mônywa township. Some of the subordinate hamlets originally belonged to the Kaing-Sèywa circle of Sagaing and were transferred to the Lower Chindwin district in 1894. The land on either side is subject to inundation and is fertile, the region on the west up to the true bank of the Chindwin river being cultivated with beans and other spring-ripening crops, and that on the east being terraced for rice cultivation. The village contains some thirty acres of betel-vine. It had a population of 1,472 persons in 1891; 1,627 in 1901; and the number was estimated to have risen to 1,737 in 1906-07.

Thazi.—A large village fifteen miles north-east of Mônywa in the Mônywa township, situated on the Thazi stream, a torrent which descends from the Mu-Kyaukka watershed and empties itself into the Chindwin south of Alôn. Thazi is a distributing centre for the villages on the Kyaukka-Mu plateau and contains a number of small traders. The population numbered 3,489 persons in 1891, and was estimated at 2,700 in 1901 and 3,010 in 1906-07. There is a Civil Police station.

Thitsein.—A village a few miles south of Nyaungbyubin, in the south-west of the Mônywa township. The population was estimated at 1,012 persons in 1901 and 1,011 in 1906-07. The village contains some betel-vine cultivation, and also cultivates rice, some of which derives the water required for a cold-weather crop from river inundation, whilst the remainder is laboriously irrigated for a hot-weather crop with water drawn from wells by means of the bucket and lever.

Wayaung.—A village situated near the Sagaing border in infertile, gravelly country, in the south of the Mônywa township, some twenty miles east of Mônywa. The population was estimated at 1,258 persons in 1906-07, and includes about eighty households of tattooers, *vide* Chapter VI.

Yinmabin Subdivision.—One of the two subdivisions of the district, comprising the Kani, Salingyi and Palè townships, and, in the north, bestriding the Chindwin river. The headquarters are at Yinmabin, a village with a population of 643 souls, in the Salingyi township, about sixteen miles west of Mônywa. The boundaries of the subdivision are: on the east, the western boundary of the Mônywa subdivision, from the Shwebo border in the north to Chaungwa on the Chindwin, and thence the Chindwin river to the mouth of the South Yama stream; on the south, that stream divides the subdivision from Pakôkku district for some twenty-five miles, as far as Kyaukkôn village, whence the boundary is an ill-defined line running up to the Pôndaung hill range; on the west the subdivisional boundary is the district boundary, which is described in Chapters I and V; on the north the subdivisional boundary is the district boundary with the Upper Chindwin, and, as far as the Chindwin river, is described in Chapter V. East of the Chindwin the subdivisional and district boundary is an ill-defined line, traversing main drainage lines in an easterly and then south-easterly direction to the northwest corner of the Mônywa subdivision. The

area and population of the townships comprising the present subdivision have been, by census—

Year.	Area in square miles.	Total population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	2,542	110,498	49,572	60,926	110,355	61,143
1901 ...	2,542	130,772	59,746	71,026	130,245	87,860

The figures disclose the same preponderance of females as in the Mônywa subdivision, and the subdivision is almost wholly Buddhist and—to a greater extent than the eastern subdivision—agricultural. The area cultivated has been—

	Acres.
1903-04	149 819
1906-07	225,355

The large extension of cultivation has been in the two outlying townships, Palè and Kani, and is probably due to more accurate registration in the later year, after the Summary Settlement. The collections of land-revenue and *thathameda* together have risen from Rs. 3,06,489 in 1902-03 to Rs. 3,57,378 in 1906-07.

Kani Township.—The northernmost of the three townships of the Yinmabin subdivision, and the largest of the five townships in the district. It lies between 22° 2′ and 22° 50′ N. and 94° 16′ and 95° 5′ E. and, in the north, bestrides the Chindwin river. The boundaries are: on the east, the Mônywa subdivision, *vide supra*; on the south, the North Yama stream from Kyaukmyet village at its mouth to a point north of Chin-byit village in the west, thence an artificial line north to the Thapan stream, a left-bank tributary of the North Yama; thence that stream for a few miles north, thereafter a tributary, and finally an artificial line running west to the district border on the Pôndaung; on the west and north the township boundary is the district boundary with the Pakôkku, Upper Chindwin and Shwebo districts, *vide* Chapters I and V. The township was transferred from the Eastern (renamed Budalin, now Mônywa) to the Western (renamed Palè, now Yinmabin) subdivision in 1894. The township corresponds approximately with the Kani-Mingin *nè*, or administrative district, of Burmese times, *vide* Chapter IX. The nature of the township is hilly,

especially on the western side, where it runs up to the parallel ranges of the Mahudaung, Pôndaung and, for a few miles, Pônnya, the first-named averaging 2,000 feet in height and the second and third from 3,000 to 4,000 feet. The hilly regions on the west and north—excluding the Sè-ywa glen on the north-west—have been constituted reserved forest: a description of them is given in Chapter V. The rainfall varies from semi-wet-zone conditions in the north and west to dry-zone conditions in the south-east, *vide* Chapter VIII. The area and population by census have been—

Year.	Area in square miles.	Population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	1,788	41,232	18,956	22,276	41,231	21,386
1901 ...	1,788	48,717	22,589	26,128	48,393	35,537

The cultivated area in 1904-05 was 82,613, and in 1907-08 78,502 acres. The collections of land-revenue amounted to Rs. 1,126 in 1902-03 and Rs. 55,066 in 1906-07; the *thathameda* amounted to Rs. 1,09,140 in the former, and Rs. 68,777 in the latter year. The headquarters are at Kani, a prosperous village on the right bank of the Chindwin.

Kônywa.—A village on the north or left bank of the North Yama stream, on the southern border of the Kani township, twenty-one miles west of Mônywa. The population, which is for the most part engaged in the cultivation of early wet-weather (*kaukti*) rice—irrigated by means of a sand training-bank pushed out across the Yama stream, *vide* Chapter IV, *Irrigation*—was estimated at 1,001 persons in 1906-07.

Yinbaungdaing or *Yinmadaing.*—A village on the north or left bank of the North Yama stream, on the southern border of the Kani township. The population was estimated at 1,030 persons in 1906-07. Palm-sugar is produced in some quantities at this village.

Salingyi Township.—The south-eastern township of the Yinmabin subdivision. The boundaries are: on the east, the Chindwin river; on the south, the South Yama stream, from Ngakôn at its mouth to a point west of Shwelaung

village, six miles west of Kyadet; on the west, an irregular line—in most places artificial and in some places sharply re-entrant—running from that point northwards to the North Yama stream, which it meets west of Zidaw village; on the north, the North Yama. The township lies between 21° 49′ and 22° 8′ N. and 94° 47′ and 95° 10′ E. It was known until 1894 as Eastern Pagyi. On the south and west, the township is a low-lying plain of the so-called black-cotton soil; on the east and north it rises to an upland of red soil, from which emerge conspicuous hills at Letpadaung and Powindaung. Round the latter hill occur many small artesian springs, *vide* Chapters I and IV (*Irrigation*). There is irrigation from both Yamas and, on the whole, the conditions of soil and water-supply favour cultivation. The area and population by census have been—

Year.	Area in square miles.	Population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	296	43,658	18,914	24,744	43,626	23,288
1901 ...	296	50,814	22,581	28,233	50,746	25,219

The headquarters are at Salingyi. Except for palm-sugar working in the riverine fringe, oil-pressing, the salt industry and pot-making at Salingyi, and one or two inconsiderable crafts in other villages, the occupation of the people is agriculture. The cultivated area was in 1903-04 93,818, and in 1906-07, 86,529 acres. The collections from land-revenue amounted to Rs. 2,094 in 1902-03 and Rs. 64,770 in 1906-07; and from *thathameda* to Rs. 1,18,049 in the earlier and Rs. 73,972 in the later year.

Kangôn.—A village near the southern angle formed by the North Yama and the Chindwin river, in the north-eastern corner of the Salingyi township. The population was estimated at 1,127 persons in 1906-07. One or two households make drums (*osi*), but the village is mainly agricultural.

Kyadet.—A village on the north bank of the South Yama stream, in the south-west of the Salingyi township, about ten miles west of the mouth of the stream. Kyadet lies at the southern terminus of a metalled road which leads through Salingyi to the important market-town of Satôn on the Chindwin river, and is on the border of a

fertile plain of black soil. The population was estimated at 1,386 persons in 1901 and 1,355 in 1906-07.

Linzagyet.—A village on the South Yama stream, six miles west of its mouth at Ngakôn and on the southern border of the Salingyi township. The village depends on the cultivation of winter-ripening rice, which is irrigated by means of sand-banks pushed across the South Yama. The population was estimated at 1,011 persons in 1906-07.

Ngakôn.—A village situated at the mouth of the South Yama stream, in the south-eastern corner of the Salingyi township. The soil in the neighbourhood of the village is irrigated both from the South Yama and from the Bôksu stream and produces an abundant crop of onions; the method of cultivation is described in Chapter IV. The population was estimated at 1,061 persons in 1901 and 1,118 in 1906-07.

Salingyi.—The headquarters station of the township of the same name, is situated in high-lying, uneven country, a few miles west of the Chindwin, with which it is connected by a metalled road, terminating at Satôn on the river. Salingyi was in Burmese times the headquarters of the *wun*, or Governor, of the Pagyi *nè*, or Burmese administrative district. The population was estimated at 1,503 persons in 1901 and 1,282 in 1906-07. The predominant industries are the pressing of sesamum oil in indigenous presses (*sizôn*) worked by bullocks, and the extraction and concentration of salt brine, *vide* Chapter V, *Minerals*. Earthen pots are also manufactured.

Satôn.—An important village on the right or western bank of the Chindwin river, a few miles south of Mônywa. The village has a District Fund market and is a regular port of call for the Irrawaddy Flotilla Company's steamers. Much of the sesamum (in the form of seed, oil, or cake), palm-sugar, and gram from the south-west of the district is shipped on steamers or on native cargo-boats at Satôn, and salt, salt-fish, kerosene oil, matches and other miscellaneous commodities are disembarked here for ultimate distribution among the inland villages of the Salingyi and Palè townships, *vide* Chapter VI, *Trade*. The population was estimated at 1,602 persons in 1906-07.

Palè Township.—The south-western township of the Yinmabin subdivision, lying between 21° 48′ and 22° 10′ N. and 94° 25′ and 94° 55′ E. The boundaries are: on the east, the Salingyi township (*q.v.*); on the south and west, the district boundary; on the north, the Kani township (*q.v.*). The township was known as Western Pagyi up to 1894 and,

later, as Mintaingbin. The country is level in the east, but in the west runs up to the Pagyi hills, and, beyond them, to the lofty Pôndaung range: between these ranges lie the Kuhnit-ywa and Shit-ywa valleys. Climatic conditions range from semi-wet-zone in the west to those of the dry zone in the east (*vide* Chapter V). The area and population by census have been—

Year.	Area in square miles	Population.	Males.	Females.	Buddhists.	Agriculturists.
1891 ...	458	25,608	11,702	13,906	25,498	16,469
1901 ...	458	31,241	14,576	16,665	31,106	27,104

The headquarters are at Palè. The ratio of agriculturists to the whole population is high. Except in the western villages, where bamboo mats are plaited—often as a subsidiary occupation—agriculture may be said to be the sole avocation The cultivated area was 58,427 acres in 1905-06 and 62,911 acres in 1907-08. The land-revenue amounted to Rs. 1,250 in 1902-03 and Rs. 47,093 in 1906-07; *thathameda* to Rs. 74,830 in the earlier and Rs. 47,700 in the later year.

Chinbyit.—A village on the south bank of the North Yama stream, on the northern border of the Palè township. The village is situated on the eastern slope of the Pagyi hills, and a road sixteen miles in length crosses the hills and leads to Zeiktaung in the Kuhnit-ywa valley, immediately beneath the Pôndaung range.

Two British officers, Major Kennedy and Captain Beville, were killed in an engagement with dacoits at Chinbyit in October 1887, *vide* Chapter II, and are buried six miles away at Mintaingbin, their graves being placed beneath a tree in a monastery near that village.

The population was estimated at 679 persons in 1901 and at 1,098 in 1906-07.

Hlawga.—A village in the south-east of the Palè township. It lies at the western edge of the western blacksoil region, and the population was estimated at 1,250 persons in 1891 and 1,185 in 1906-07.

Kyènin.—A village in the east of the Palè township. The population, which depends chiefly on the cultivation

of winter-ripening rice, was estimated at 1,287 persons in 1906-07.

Letpagan.—A village in the south-east of the Palè township, near an extensive plain of black soil. The population was estimated at 1,064 persons in 1906-07.

Mónthwin.—A village in the north of the Palè township, east of Chinbyit. The population was estimated at 1,041 persons in 1906-07.

Nyaung-ón.—A village in the south-east of the Palè township, north-east of Panywa. The population was estimated at 1,089 persons in 1906-07, and includes several households of blacksmiths and sandal-makers.

Palè.—The headquarters station of the township of the same name. The village was for some years the headquarters of the Palè (now Yinmabin) subdivision. The public buildings are a Township Officer's court-house, a Civil Police station, and an inspection bungalow. The population was estimated at 1,274 persons in 1891 and 1,195 in 1906-07.

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[The authority for statements and statistics in the text is generally the *District Annual Administration Report* for recent, and the *Provincial Administration Reports* for earlier, years, and, in places, the *B Volume of the District Gazetteer* and the Deputy Commissioner's *Main Files*. The authority for special sections and statements is often quoted in the text. For the passages dealing with Burmese history and administration, besides the sources mentioned below, there are the *British Burma Gazetteer* of 1880; and Mr. (now Sir J. G.) Scott's *Gazetteer of Upper Burma and the Shan States*, 1901. The *Census Reports* of 1891 and 1901 contain an occasional mention of facts concerning the district, as do some of the *Industrial Monographs*. The major portions of Chapter III, The People; IV, Agriculture and Irrigation; VI, Occupations and Trade; VIII, Famine; and X, Revenue Administration, are derived from information collected at the Revenue Settlement of 1906-09.]

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